ENVIRONMENTAL MANAGEMENT IN FORESTRY DEVELOPMENTS PROJECT

CONSERVATION EVALUATION OF SOME NATURAL FORESTS IN SRI LANKA

A Project of the

Forest Department
Ministry of Lands, Irrigation and Mahaweli Development

in association with

UNDP, FAO and IUCN-THE WORLD CONSERVATION UNION

April 1993

The Environmental Management Component of the Environmental Management in Forestry Developments Project is being implemented by the Forest Department with technical assistance from IUCN - The World Conservation Union under contract No. DP/SRL/89/O12-O01/FODO to the Food and Agricultural Organisation of the United Nations. It is being funded by the United Nations Development Programme in accordance with the Project Document: Environmental Management in Forestry Developments (December 1989). This Component aims to strengthen the institutional capacity within the Environmental Management Division of the Forest Department and the Forestry and Environment Division in the Ministry of Lands, Irrigation & Mahaweli Development. It is located in the Forest Department. This manual is one of a series of documents prepared by IUCN consultants which provide a record of the activities undertaken by the project.

Authors: Michael J.B. Green, International Consultant/Conservation Review (Parts A,C and D)

E.R.N. Gunawardena, National Consultant/ Soil Conservation & Hydrology (Part B)

CONTENTS

Page

CONTENTS i
EXECUTIVE SUMMARY v

PART A BIOLOGICAL DIVERSITY

1. INTRODUCING THE CONCEPT OF BIOLOGICAL DIVERSITY

1.1 WHAT IS BIOLOGICAL DIVERSITY? 1

1.2 WHERE IS BIOLOGICAL DIVERSITY FOUND? 2

1.3 LEVELS OF DIVERSITY: THE CONCEPT OF RARITY 2

1.4 WHY CONSERVE BIOLOGICAL DIVERSITY? 3

1.5 HOW BEST TO CONSERVE BIOLOGICAL DIVERSITY?
1.5.1 Criteria for selection of protected areas 5

1.6 SRI LANKA'S BIOLOGICAL DIVERSITY
1.6.1 Status and distribution 6
1.6.2 Past and present conservation initiatives 7

2. A METHODOLOGY TO ASSESS SRI LANKA'S BIOLOGICAL DIVERSITY

2.1 INTRODUCTION 8

2.2 SURVEY DESIGN
2.2.1 Gradsect sampling 9
2.2.2 Conservation evaluation 9

2.3 CONSTRAINTS 10

3. SAMPLING BIOLOGICAL DIVERSITY IN SRI LANKA'S FORESTS

3.1 INTRODUCTION 12

3.2 CRITERIA FOR SELECTING FORESTS TO SURVEY 12

3.3 GRADSECT SAMPLING 12

3.4 SAMPLING WITHIN PLOTS
3.4.1 Fauna 15
3.4.2 Flora 18

3.5 OBSERVATIONS BETWEEN PLOTS 18

3.6 CONSTRAINTS
3.6.1 Sampling faunal diversity 18
3.6.2 Sampling adequacy 18

REFERENCES 20

Annex 1 PLOT DESCRIPTION FORM 23
Annex 2 SPECIES INVENTORY FORM 24
Annex 3 RESOURCE USE DESCRIPTION FORM 25
Annex 4 BIOLOGICAL DIVERSITY ASSESSMENT: AN EXAMPLE 26

PART B SOIL CONSERVATION AND HYDROLOGY

1. IMPORTANCE OF FORESTS FOR SOIL CONSERVATION AND HYDROLOGY

1.1 INTRODUCTION 29

1.2 TROPICAL FORESTS AND SOIL CONSERVATION 29

1.3 HYDROLOGICAL IMPORTANCE OF TROPICAL FORESTS
1.3.1 Rainfall 30
1.3.2 Water yield 30
1.3.3 Floods 31

2. ASSESSING FORESTS FOR SOIL CONSERVATION AND HYDROLOGY

2.1 INTRODUCTION 32

2.2 SOIL EROSION
2.2.1 Assessment of the importance of forests for soil conservation 32
2.2.2 Ranking forests for soil erosion 34

2.3 HEADWATERS 35

2.4 FLOOD HAZARD
2.4.1 Estimating flood hazard from catchment characteristics 35

2.5 FOG INTERCEPTION AT HIGHER ALTITUDES 36

2.6 EVALUATION
2.6.1 Preliminary ranking 37
2.6.2 Final ranking 37

2.7 CONSTRAINTS 37

REFERENCES 38

Annex 1 SOIL CONSERVATION AND HYDROLOGY ASSESSMENT: AN EXAMPLE ... 41

PART C THE CONSERVATION VALUE OF NATURAL FORESTS IN SOUTHERN PROVINCE: A PRELIMINARY REPORT

1. INTRODUCTION

1.1 PHYSIO-CLIMATIC CHARACTERISTICS OF SOUTHERN PROVINCE 51

1.2 METHODS
1.2.1 Biological diversity 52
1.2.2 Soil conservation and hydrology 56

2. BIOLOGICAL DIVERSITY ASSESSMENT

2.1 SPECIES DIVERSITY WITHIN INDIVIDUAL FORESTS 58

2.2 INFLUENCE OF FOREST SIZE
2.2.1 Species diversity 58
2.2.2 Rare and endemic species 64

2.3 SPECIES DIVERSITY WITHIN FOREST COMPLEXES
2.3.1 Woody plants 64
2.3.2 Animals 64

2.4 DEFINING A MINIMUM CONSERVATION AREAS NETWORK 72

2.5 OPTIMISING THE CONSERVATION AREAS NETWORK FOR FAUNA 72

2.6 COMPARISON BETWEEN ACR AND NCR 72

3. SOIL CONSERVATION AND HYDROLOGY ASSESSMENT

3.1 IMPORTANCE OF FORESTS FOR SOIL CONSERVATION 75

3.2 HYDROLOGICAL IMPORTANCE OF FORESTS
3.2.1 Protection of headwaters of river systems 75
3.2.2 Protection from flooding 75
3.2.3 Hydrological importance 80

3.3 IMPORTANCE OF FORESTS FOR SOIL CONSERVATION AND HYDROLOGY . 80

3.4 SOIL CONSERVATION/HYDROLOGY AND BIOLOGICAL DIVERSITY 81

4. DISCUSSION AND CONCLUSIONS

4.1 DISCUSSION
4.1.1 Costs of optimal networks 86
4.1.2 Constraints 90

4.2 CONCLUSIONS 91

REFERENCES 92

Annex 1 LIST OF WOODY PLANT SPECIES 93
Annex 2 LIST OF SPECIES OF SELECTED GROUPS OF ANIMALS 123
Annex 3 NEW LOCALITY RECORDS OF RARE SPECIES OF WOODY PLANTS 141
Annex 4 NEW LOCALITY RECORDS OF ENDEMIC ANIMAL SPECIES 144

PART D FUTURE STRATEGY AND PROGRAMME

1. FUTURE STRATEGY AND PROGRAMME TO COMPLETE THE NCR

1.1 INTRODUCTION 147

1.2 REVIEW OF PROGRESS 147

1.3 IDENTIFICATION OF REMAINING FORESTS TO SURVEY 148
1.3.1 Completion of wet zone 149
1.3.2 Completion of dry zone 149

1.4 FUTURE STRATEGY 151

1.5 FUTURE PROGRAMME
1.5.1 Fieldwork 151
1.5.2 Identification of specimens 152
1.5.3 Database management 152
1.5.4 Taxonomic lists 153

REFERENCES 153

Annex 1 LIST OF SITES REVIEWED FOR THE NCR 154

EXECUTIVE SUMMARY

The recently created Environmental Management Division within the Forest Department is currently undertaking a National Conservation Review (NCR) of all remaining natural forest and related grasslands within Sri Lanka, as part of the Environmental Management Component of the Environmental Management in Forestry Developments Project. The NCR addresses the biological importance of natural forests, largely in terms of their species diversity, together with their value for soil conservation and hydrology. It is being carried out by a team of scientists comprising three national consultants (botanist, zoologist and hydrologist) and an Assistant Conservator of Forests, with technical assistance provided by an international consultant. This document consists of a description of the methodologies used to evaluate the importance of natural forests, a report on the results of fieldwork undertaken to date, and an assessment of the additional resources required to complete the NCR.

A method of rapidly assessing biological diversity within natural forest has been developed by the NCR team and is fully described in **Part A**. Known as gradsect sampling, it is based on sampling along environmental gradients to provide a description of the full range of species diversity within forests, overcoming problems of inadequate representative sampling and accessibility while minimising survey costs. Sampling is limited to woody plants, vertebrates and selected invertebrate groups (molluscs and butterflies). Part A was originally prepared as manual for a workshop on *Assessing the Biological Diversity of Sri Lanka's Natural Forests*, held in Sinharaja National Heritage Wilderness Area, 2-5 December 1992.

Rapid techniques for assessing the hydrological value of forests and their importance for soil conservation have been developed using four main criteria. These are control of soil erosion and flooding, protection of headwaters of river systems and, in the case of forests at higher altitudes, contribution of additional moisture through interception of fog. The methodology is described in **Part B**.

Southern Province, comprising Galle, Matara and Hambantota districts and representing approximately 10% of the country, has been surveyed to date. The results of this survey are presented in **Part C**. Many species of plants and animals, including endemics and rarities, have been recorded in new localities and some species thought to be new to science have been discovered. An analysis of species' distribution patterns and topographic variables, such as rainfall, slope, soil type and stream frequency, shows that virtually all remaining natural forests in the Province are of considerable importance for biological diversity, as well as for control of soil erosion and flooding and for protection of headwaters. Optimal networks of forests which meet a range of conservation criteria are identified. The results of this survey are preliminary, however, until such time as the NCR is completed and the importance of these forests can be evaluated within a national context. The need to review the legal conservation status of many of these forests is clearly demonstrated.

Progress achieved to date by the NCR is reviewed in **Part D**. It is estimated that remaining districts in the wet and dry zones will each take another two years of fieldwork. This is well beyond the resources of the present Project, and a strategy for completing the NCR within the overall time frame of the Environmental Management in Forestry Developments Project is elaborated. Natural forests to be surveyed are identified and a future programme of work is outlined.

Completion of the NCR will represent a major achievement for the Environmental Management Division, enabling an optimal network of conservation forests to be defined and providing the basis for informed decisions to be made concerning the future use of forest resources. In the longer term, the information generated by the NCR represents an extremely powerful tool for evaluating the potential impact of proposed development projects on forests, for monitoring changes in the biota and for management planning, particularly with respect to zonation.

PART A

BIOLOGICAL DIVERSITY

1. INTRODUCING THE CONCEPT OF BIOLOGICAL DIVERSITY

1.1 WHAT IS BIOLOGICAL DIVERSITY?

A country's biological wealth can be measured in terms of its biological diversity, the product of millions of years of evolution and thousands of years of cultivation of plants and domestication of animals. It is extremely valuable, more important than the cultural or material wealth of a country (Baldwin *et al.*, 1991).

Biological diversity, or biodiversity, is the variety of life forms, the ecological roles they perform and the genetic diversity they contain (Wilcox, 1984). It is an umbrella term used to describe the total variety of life (microbes, fungi, plants and animals) on Earth, encompassing both the number and frequency of genes, species or ecosystems within a given assemblage (McNeely, 1988). This diversity of living organisms is so high that much of it has yet to be identified. Variously estimated at 5-100 million or more, only about 1.7 million species have actually been described (Wilson, 1988; WCMC, 1992a)[1].

It has become widespread practice to define biological diversity in terms of genes, species and ecosystems, corresponding to three fundamental and hierarchically-related levels of biological organisation (WCMC, 1992a):

- genetic diversity is about the range of genetic material in the world's living organisms. It is a concept concerning the variability within a species, upon which depend the breeding programmes necessary to protect and improve cultivated plants and domesticated animals as well as much scientific advance and innovation. It is measured by the variation in genes, the chemical units of hereditary information that may be passed from one generation to the next.

- species diversity is about the variety of living organisms on Earth. It is measured by the total number of species[2] within a given area under study. The species level is generally regarded as the most natural one at which to consider whole-organism diversity, being the primary focus of evolutionary mechanisms.

  [NB This manual is concerned principally with species diversity.]

- ecosystem diversity is about the variety of ecological complexes (habitats) within which species occur. Their health and conservation are crucial to the well-being and survival of the species which they support. It is difficult to assess ecosystem diversity because there is no unique definition and classification at the global level. Moreover, unlike genes and species, ecosystems explicitly include abiotic components, being partly determined by soil parent material and climate.

While species diversity may be strongly correlated with ecosystem diversity, it is usually not possible to have both maximum species diversity and maximum genetic diversity. Genetic diversity increases with the size of a population, but a population increase in some species may lead to a decline in others, or even to a reduction in species diversity. Thus, strategies to conserve biological diversity must be directed towards maintaining the diversity of species and their associated habitats, while ensuring that no species falls below the minimum population level at which its future viability is severely at risk due to the loss of genetic diversity.

---

[1]Of these described species, approximately 250,000 are flowering plants, over 1 million are invertebrates (insects are the largest group with 950,000 species) and about 45,000 are vertebrates (WCMC, 1992a).

[2]A species is a group of actually or potentially interbreeding living organisms reproductively isolated from other such groups (Mayr, 1969).

1.2 WHERE IS BIOLOGICAL DIVERSITY FOUND?

Biological diversity in the wild is not distributed uniformly across the planet. Most of it is concentrated in the tropics where conditions are hot and wet (McNeely, 1988; WCMC, 1992a). Lowland tropical terrestrial ecosystems tend to have the highest diversity, with diversity declining with precipitation and latitude (or altitude). Tropical forests, for example, contain over half of the world's biological diversity. Similar generalisations apply to aquatic ecosystems. Coral reefs, lakes and wetlands in the tropics exhibit a higher diversity than temperate systems. Apart from precipitation and temperature gradients, biological diversity is also governed by nutrient and salinity levels in terrestrial and aquatic ecosystems, respectively.

Islands or small areas of habitat tend to have fewer species than large areas of the same type of habitat (see Section 1.5.1), but geographically isolated islands often hold proportionately higher numbers of endemic species[3] than elsewhere.

Within these broad limits, some areas are centres of high biological diversity ('hot spots') due to factors such as soil complexity, altitudinal variation, climate, and geological and anthropological history.

Human influences tend to reduce biological diversity, particularly where they are intensive and long-standing, as with permanent agriculture. Diversity may increase, however, as a result of limited human activities, such as some systems of shifting cultivation at low human population densities.

1.3 LEVELS OF DIVERSITY: THE CONCEPT OF RARITY

Species may be rare on account of their local abundance, habitat specificity and/or geographic distribution (Bond, 1989; Ferrar, 1989).

- **Local abundance** or population size may be influenced considerably by a variety of direct and indirect management techniques. A species that is rare within a community is known as an **alpha** rarity.

- **Habitat specificity** is a highly complex and genetically determined attribute which largely falls outside the influence of conservation management. A habitat specialist is known as a **beta** rarity.

- **Geographic distribution** may be influenced to some extent by conservation management, subject to the limitations of the adaptability of the species and the extent and distribution of habitable areas. A geographically restricted or narrowly endemic species is known as a **gamma** rarity.

There are eight possible permutations of these three levels of diversity, giving seven types of rarity and one that is common to all levels. The classification of species according to these levels of diversity provides a basis for prioritising conservation action (Table 1). Thus, species which are rare for a single level of diversity should receive a lower priority than those rare for two attributes. Highest priority should be given to species rare for all three levels of diversity (i.e. highly specialised and restricted endemics, with markedly reduced populations).

In most natural or near-natural systems the majority of species are relatively rare. This 'natural' or 'static' rarity is quite distinct from rarity induced by a decline in numbers. The reduction of rarity is a biologically valid goal for conservation only in the case of induced rarity, not natural rarity (Ferrar, 1989). Thus, while species naturally rare on account of their beta or gamma diversity need to be conserved, efforts to reduce rarity are valid only in the case of species with locally declining populations.

---

[3]An endemic species is one which is restricted to a particular locality or region.

Table 1 Possible permutations of species distribution (adapted from Bond, 1989)

alpha diversity Local abundance	**beta diversity** Habitat specificity	**gamma diversity** Geographic range	Conservation priority:
abundant	generalist	widespread	none
abundant	specialist	widespread	low
abundant	generalist	endemic	low
rare	generalist	widespread	low
abundant	specialist	endemic	intermediate
rare	specialist	widespread	intermediate
rare	generalist	endemic	intermediate
rare	specialist	endemic	high

1.4 WHY CONSERVE BIOLOGICAL DIVERSITY?

Biological resources provide the basis for life on earth. Their values in social, ethical, cultural and economic terms have been recognised by societies in religion, art and literature from the earliest days of recorded history. Their importance is reflected in the increasing efforts made by governments to formulate and implement policies, legislation and programmes to ensure that biological resources are conserved. The signing of the Convention on Biological Diversity[4] by 157 countries at the United Nations Conference on Environment and Development (Rio de Janeiro, June 1992), better known as the Earth Summit, highlights the worldwide importance given to the conservation of biological diversity and its high priority on the international agenda.

Conservation is the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations (IUCN, 1980). Thus, conservation does not mean preservation but wise use, thereby contributing to sustainable development. Sustainability is the basic principle of all social and economic development because it optimises the social and economic benefits available in the present without jeopardising the likely potential for similar benefits in the future (McNeely *et al.*, 1990). Preserving the diversity of biological resources ensures that present and future options for their wise use are maintained, and that the biosphere is kept in a state supportive of human life (WCMC, 1992a).

The values of biological resources can be classified in terms of their direct and indirect benefits (McNeely, 1988):

Direct Values

- **Consumptive use value** is the non-market value of natural products, such as firewood, game and fodder, that are consumed directly, without passing through a market.

- **Productive use value** is the value of natural products harvested commercially, such as fish, medicinal plants and timber.

Indirect Values

[4]The principal objectives of the Convention are the conservation of biological diversity, the sustainable use of its components, and the sharing of benefits that come from the use of genetic resources.

Indirect benefits are seldom accounted for in cost-benefit analyses, but they may far outweigh direct benefits.

- **Non-consumptive use value** is concerned primarily with nature's services rather than her goods through the proper functioning of ecosystems, such as watershed protection, photosynthetic fixation of solar energy, regulation of climate and soil production. It also includes recreational, aesthetic, spiritual, cultural, scientific and educational values.

- **Option value** is concerned with maintaining as many gene pools as possible, particularly for those wild species which are economically important or potentially so, in anticipation of unpredictable events, both biological and socio-economic. It is the value of keeping options open for the future.

- **Existence value** is the value of ethical feelings towards the very existence of wildlife.

Biological resources have multiple values which are perceived in different ways according to needs. At the local level, consumptive use value is often the most relevant, while national governments tend to be most interested in productive use value, often in terms of revenue from foreign exchange earnings. Although many products of natural resources are traded internationally, the world community is also likely to be interested in non-consumptive use and existence values, particularly as it grapples with global issues such as climate change and rising sea level.

Assessing the value of biological resources is an essential first step towards sound development, enabling planners and resources managers to address their conservation. The second step is deciding how best to conserve such resources, which is discussed in the next section.

1.5 HOW BEST TO CONSERVE BIOLOGICAL DIVERSITY?

One of the best-known and most effective ways of conserving biological diversity in order to better meet the material and cultural needs of mankind now and in the future is through the establishment and management of protected areas[5] (MacKinnon *et al.*, 1986; McNeely, 1988). In a strategy paper recently produced by The World Bank, it is recognised that "setting up comprehensive and well-managed protected area systems is likely to be the most practical way to preserve the greatest amount of the world's biological diversity and the ecological processes that define and mould it" (Braatz, 1992).

Protected areas can be managed according to a wide spectrum of objectives ranging from strict protection to sustainable use, depending on conservation and development priorities. Very often it may be necessary to zone a protected area to provide for a range of management objectives and multiplicity of uses. Zonation can also be used to buffer ecologically sensitive core areas from external pressures.

Such integration of strict protection with sustainable use forms the basis of the biosphere reserve concept, first launched in 1971 under the Unesco Man and Biosphere Programme and now being widely applied to resolve the often conflicting interests of conservation and development. The concept provides for the zonation of a biosphere reserve into areas of different use, with a strictly protected core area of high biological value buffered by concentric zones under progressively more intensive but sustainable forms of management towards its periphery (Batisse, 1986).

Maintenance of biological diversity on land outside protected areas is also essential, particularly in the Asia-Pacific region where less than 4% of total land area is protected (Braatz, 1992). Some of the more innovative and cross-sectoral approaches to conserving biological diversity are reviewed by McNeely *et al.* (1990).

---

[5] As recently defined at the IV World Congress on National Parks and Protected Areas, Caracas, 10-22 February 1992, *a protected area is an area of land and/or sea managed through legal or customary regimes so as to protect and maintain biological diversity and natural and associated cultural resources.*

1.5.1 Criteria for selection of protected areas

To ensure that protected areas function with maximum effect, they should be selected in accordance with principles of conservation biology. The following criteria provide a basis for the selection of protected areas.

Size *Protected areas should be as large as possible in order to (a) minimise risks of species' extinctions and (b) maximise representation of species.*

(a) Given that protected areas are effectively islands of natural or near-natural habitat in a sea of humanity, they should be as large as possible to maximise the degree to which their contents retain their integrity and to minimise extinction rates. The larger a protected area is, the better it is buffered from outside pressures (Soule, 1983).

While many of the human pressures on species and their habitats can be reduced or removed through more effective management, chance demographic and genetic events are more difficult to overcome. Since genetic variability is rapidly lost in small populations due to genetic drift (random changes in gene frequencies) and inbreeding (breeding among close relatives), populations should be maintained as large and diverse as possible (Wilcox, 1984).

Thus, protected areas need to be large enough to support minimum viable populations of key species. Good candidates are umbrella species, whose conservation will provide a protective umbrella for other associated species, and ecologically significant species which occupy central positions in the food webs of communities (Wilcox, 1984). Populations of key species should consist of at least 500 genetically effective individuals, or a total population of about 1,000 individuals including juveniles and other non-breeders, in order to maintain sufficient variability for adaptation to long-term changing environmental conditions (Frankel, 1983; Soule, 1987)[6].

(b) Protected areas should encompass as wide a contiguous range of ecological communities as possible because few species are confined to a single community and few communities are independent from those adjacent to them (MacKinnon *et al.*, 1986). The more communities represented, the greater the number of species and the greater the complexity of ecological interactions. Maximum representation of communities is best achieved by ensuring that the entire range of an environmental gradient, such as altitude or soil type, is included.

There is a relationship between the number of species within a relatively uniform area and the size of that area. As a general rule, for every 10-fold decrease in the size of an area, 30% fewer species are present (Wilcox, 1984). The relationship has been described by a variety of equations (see Nicholls, 1991), of which the most usually used are: species richness (S) as a power function of area (A),

$$S = kA^z(1+e)$$

and its logarithmic transformation,

$$\ln(S) = \ln(k) + z\ln(A) + \ln(1+e)$$

where k and z are constants (or parameters) and e is the stochastic or random component of the model.

Shape *Protected areas should be of a compact shape in order to minimise 'edge effects', and their boundaries should be biogeographically meaningful.*

---

[6]For short-term survival of serious inbreeding and its deleterious effects, the minimum viable population is estimated to be 50 breeding individuals (Soule and Wilcox, 1980).

Edge effects, such as colonisation by invasive species from adjacent disturbed habitats or human encroachment, can be minimised by selecting compact shapes, preferably circular. Boundaries should follow natural topographic features, but watersheds are preferable to rivers because the latter often bisect essential terrestrial habitats of a range of species (MacKinnon *et al.*, 1986).

Corridors and clusters *Protected areas should be linked to each other by corridors of natural or semi-natural habitat or located in clusters to prevent them from becoming completely isolated from each other.*

Corridors and clustering of protected areas enable animals to move between adjacent sites, thereby maximising the exchange of genetic material between neighbouring populations. They also increase the effective size of protected areas.

Representativeness *The full complement of biological diversity within a region should be represented within a network of protected areas.*

Given that it is seldom possible to protect entire geopolitical units in their natural state, networks of geographically scattered protected areas need to be established which are representative of every ecological community within a region.

Networks should be optimal in terms of the amount and uniqueness of biological diversity protected per unit area to make most efficient use of scarce land resources for conservation. This is best achieved by giving priority to centres of high species diversity.

Pragmatic considerations *should be incorporated in the selection and design of protected areas.*

For example, an area should only be protected for conservation purposes if there is a good chance of its ecological integrity being maintained. Thus, protected areas should only be established in areas where they can be afforded adequate protection (MacKinnon *et al.*, 1986).

Other important considerations are the desirability to locate protected areas in areas where they can provide a variety of goods (e.g. firewood, minor forest products) and services (e.g. research, tourism, watershed protection), and to avoid establishing them in areas of high timber or agricultural production potential unless there are no suitable alternatives (Howard, 1991).

1.6 SRI LANKA'S BIOLOGICAL DIVERSITY

1.6.1 Status and distribution

Sri Lanka, covering an area of 65,610 sq.km, is one of the smallest but most biologically diverse countries in Asia (Braatz, 1992). It has more species of flowering plants, amphibians, reptiles, birds and mammals per unit area than most other Asian nations (Baldwin *et al.*, 1991). Many of these species are endemic, for example 27% of flowering plants, 51% amphibians, 50% reptiles and 14% mammals, a reflection of the island having been separated from the Indian subcontinent since the late Mesozoic. Much of this biological diversity occurs within natural forests, particularly the rain forests of the south-west wet zone where, for example, 94% of the 830 endemic species of flowering plants are to be found.

Forest cover in Sri Lanka has declined from an estimated 84% in 1881 to 24% (1.58 million ha) in 1989. It has declined most in the south-west where only 12% of the wet zone remains forested as compared to 30% in the north-east dry zone (Baldwin *et al.*, 1991). Closed-canopy natural forest is currently estimated to cover 20.2% (1.33 million ha) of the country (Legg and Jewell, 1992). Species extinction is the most serious consequence of forest clearance: although hydrological and climatic functions performed by original forest can be re-created in man-made vegetation, once lost a species is gone for ever (Sayer and Whitmore, 1991).

This decline in forest cover is a reflection of the extremely high human population density, exceeding that of most other countries in Asia except Bangladesh and a few very small, essentially urban nations such as Hong

Kong and Singapore. The wet zone, occupying just 24% of the country, is under greatest pressure because it is settled by 55% of the island's 15 million inhabitants. Not surprisingly, therefore, this has led to a trend of increasing isolation and fragmentation of forests in this zone.

Knowledge about the status and distribution of Sri Lanka's flora and fauna is limited to species inventories of a few of the better known conservation areas, such as Sinharaja in the wet zone and Ruhuna/Yala in the dry zone, and even these sites have yet to be comprehensively surveyed. The avifauna is the only group to have been systematically surveyed across the entire country, based on the national grid (10 x 10 sq.km). Thus, a national survey of the biological diversity contained within remaining natural forests is a prerequisite to sound land use planning.

1.6.2 Past and present conservation initiatives

Sri Lanka has one of the oldest and most extensive networks of protected areas in Asia, extending over 14% of the country. Most of this network (9,053 sq.km) comprises national reserves and sanctuaries established under the Fauna & Flora Protection Ordinance and managed by the Department of Wildlife Conservation. The remaining 1,178 sq.km consists of Sinharaja, notified under the National Heritage Wilderness Areas Act, and a number of forest reserves (or parts thereof) designated as National Man and Biosphere (MAB) reserves, all of which are administered by the Forest Department (WCMC, 1992b). Following an accelerated review of the conservation importance of 30 forests in the wet zone (TEAMS, 1991), the Forest Department has earmarked 10 forests, covering 138 sq.km, for conservation (IUCN, 1992). A further 4 forests covering 121 sq.km have subsequently been added to this total.

Building on its traditional concern for forests and associated wildlife, the Government and people of Sri Lanka have ensured that care for the environment features prominently in the Forestry Sector Development Programme. A moratorium on logging in the wet zone has been introduced pending an assessment of the conservation value of its remaining rain forests. This National Conservation Review, which extends to all remaining natural forests and associated grasslands throughout the country, is being carried out by the newly created Environmental Management Division of the Forest Department as part of the Environmental Management in Forestry Developments Project, the environmental component of the Forestry Sector Development Programme (FAO, 1989).

The Project commenced in 1991 and is scheduled to run for five years. It is being implemented by the Food & Agricultural Organization of the United Nations and IUCN - The World Conservation Union, with funds from the United Nations Development Programme. The National Conservation Review is being conducted by a team of international and national consultants working alongside staff in the Environmental Management Division. The team includes a botanist, zoologist and hydrologist, and conservation and database specialists.

2. A METHODOLOGY TO ASSESS SRI LANKA'S BIOLOGICAL DIVERSITY

2.1 INTRODUCTION

Biological surveys are necessary for rational land use planning and decision-making, and they are required to resolve land use conflicts. Much of the conflict between logging and forest conservation, for example, is concerned with which species and how many are present in a particular area. If that information is present the issue can be simplified. The conflict remains but it can be resolved on the basis of facts, not guesses or unsound extrapolations. Very often, however, the information is not available and the first step towards resolving the conflict is to conduct a biological survey to determine what species are present, where they are and how many. This is the prevailing situation in Sri Lanka as already outlined (Section 1.6.1).

Financial resources for surveying biota are diminishing relative to planning needs, hence it is essential that surveys are cost-effective (Burbidge, 1991). To help ensure that costs are kept to a minimum, only relevant data should be collected and they should be available for re-use as required.

It is necessary, therefore, to develop a method of surveying biological diversity that is both comprehensive and cost-effective (i.e. rapid) in order to meet the overall objective of the Conservation Review component of the Environmental Management in Forestry Developments Project:

> to assess the conservation value of remaining forests, mangroves and grasslands in Sri Lanka.

This will enable decisions concerning future uses of these natural resources to be soundly based on scientific principles.

2.2 SURVEY DESIGN

The most widely used scientific criteria for assessing conservation value are diversity, rarity, naturalness, size and representativeness (Margules and Usher, 1981; Usher, 1986; Margules et al., 1988). Indeed, as pointed out by Mackey et al. (1989), these criteria are used to identify natural properties under the World Heritage Convention. All refer, either wholly or in part, to a common underlying theme: the maintenance of biological diversity in perpetuity.

Conservation planning in the past has usually be focused on ensuring adequate representation of communities or habitats, but many species cannot necessarily be perpetuated by the reservation of communities because of their dependence on disturbance, their peripatetic propensities (they may be nomadic among communities in response to environmental cycles or rare events) or their occurrence in chorological tension zones (i.e. community interfaces). Thus, the best conservation planning should encompass both species and communities, with priority, if any, being given to species (Kirkpatrick and Brown, 1991). In practice, the number of species has become the simplest and most commonly used measure of biological diversity (Bond, 1989), despite certain limitations (see Section 2.3), and forms the basis of this National Conservation Review.

The National Conservation Review is designed to identify an optimal or minimum set of sites which is representative of Sri Lanka's biological diversity, measured in terms of species richness. This approach will enable questions such as the following to be answered:

(i) To what extent is Sri Lanka's biological diversity represented by its existing protected areas network?

(ii) Which additional forests, mangroves and grasslands should be protected in order to create a truly representative protected areas network, as well as to conserve soil and water resources?

(iii) Are any sites within the existing network a luxury, contributing negligible additional biological diversity to the optimum network (as defined above) and having over-riding potential socio-economic value?

In order to answer such questions it is necessary first to determine the distributions of species, and then to identify a optimum set of sites which encompasses all species through some form of pattern analysis. Surveys intended to provide data for identifying a representative protected areas network require a procedure which ensures that the full range of biological diversity is sampled. Such surveys are concerned with gathering information about species' distributional patterns, rather than obtaining unbiased estimates of the abundance of individual species using standard statistical sampling techniques. Stratification is essential but practical problems of travel costs and accessibility must be incorporated into any cost-effective survey.

An additional consideration is the importance of remaining forests for soil conservation and hydrology. This is considered in Part B of the manual.

2.2.1 Gradsect sampling

Gradient-directed transect (gradsect) is the deliberate selection of transects which contain the steepest environmental gradients with maximum access present in an area (Austin and Heliger, 1991). It has been selected for the National Conservation Review as being the most appropriate technique for rapidly assessing the diversity of species contained within natural forests.

Gradsect sampling is designed to provide a description of the full range of biological diversity within a region, overcoming problems of inadequate representative sampling and accessibility, while minimising survey costs. Gradsects are deliberately selected to contain the strongest environmental gradients within a region to optimise the amount of information gained relative to expenditure of time and effort. Sampling along a gradsect maximises variation between plots and accessibility can be enhanced by choosing localities with an adequate road network to reduce travel time. It has been shown statistically that gradsects capture more information than randomly placed transects of similar length (Gillison and Brewer, 1985; Austin and Heyligers, 1989).

Previous studies (Austin 1978, Austin *et al.*, 1984) have shown that rock type, precipitation and temperature have a strong influence on the distribution of plant species. Temperature is closely correlated with altitude, which was has been chosen as the main variable for the National Conservation Review because of the ready availability of information on altitude from topographical maps (1:63,360).

2.2.2 Conservation evaluation

Historically, the selection of protected areas has tended to be *ad hoc*, often depending on the availability of land unsuitable for other forms of land use and influenced strongly by perceived threat (Leader-Williams *et al.*, 1990). This is unsatisfactory because it results in a bias of the range of species protected.

A widely-used, more systematic alternative is to rank candidate sites according to various criteria of conservation value, such as diversity, rarity, naturalness, size and representativeness as mentioned above. As discussed by Margules (1989), however, combining ranks for different criteria to derive an index of conservation value inevitably involves weighting of the criteria according to a subjective assessment of their relative importance. Moreover, a major draw back in ranking sites for their conservation value on the basis of a single application of a formula is that sites of lower conservation priority may duplicate species protected in sites of higher conservation priority (Kirkpatrick, 1983). Other problems associated with combining ranks to derive a conservation value index are reviewed by Margules *et al.* (1991).

An alternative approach being developed is to use patterns of species' distributions to identify a set of sites which encompasses all species (Margules *et al.*, 1988, 1991). This minimum set of sites in which all species (or other units of diversity) are represented at least once is the bottom line: the bare minimum. Anything less would constitute an inadequate representation of biological diversity. The algorithms can be constrained in various ways: for example, to ensure that each species is represented in at least two sites. The large area of land required to represent biological diversity, even when the number of sites is minimised, makes it unlikely that all, or even most, species will be represented in the protected areas network. However, the minimum set approach identifies explicitly which sites are needed to maximise biological diversity and, therefore, which species will not be represented in a proposed network that does not include all of those sites (Margules, 1989).

An iterative method (after Kirkpatrick, 1983) is being used to define a minimum set of sites necessary to conserve the biological diversity contained within Sri Lanka's natural forests, mangroves and grasslands. An heuristic algorithm is being developed to select a set of forests in which all species occur at least once. It consists of the following steps (adapted from Margules *et al.*, 1988):

(i) Select all forests with any species which occur only once.

(ii) Beginning with the rarest unrepresented species (ie. least frequent species remaining in the data matrix after the previous step), select from all forests in which it occurs the forest contributing the maximum number of additional unrepresented species.

(iii) Where two or more forests contribute an equal number of additional species, select the forest with the least frequent group of species (defined as that group having the smallest sum of frequencies of occurrence in the remaining unselected forests).

(iv) Where two or more forests contribute an equal number of infrequent species, select the first forest encountered.

The fourth step is order-dependent but other conservation goals, embodying new concepts, can be introduced as necessary. For example, the criterion of naturalness could be introduced by selecting the forest with the least number of exotics, or proximity to other forests by selecting the next nearest forest. The algorithm can be further modified to determine the minimum set of forests needed to represent all species twice, three or more times.

A complementary approach to consider in the National Conservation Review is the identification of a network representative of the full range of Sri Lanka's physical environments, given the strong correlation between species' distribution patterns and such physical conditions as soil, temperature and precipitation.

Hunter *et al.* (1988) consider that the selection of protected areas should be more strongly influenced by the distribution of physical environments than by that of communities, which are transitory assemblages or co-occurrences among taxa that have changed in distribution, abundance and association in response to past climatic changes. Ideally, protected areas should encompass a sufficiently broad range of physical environments to allow organisms to adjust their local distribution in response to long-term environmental changes. Given that landscapes also change, albeit over a longer timespan, protected areas should be connected by corridors to allow species to modify their geographic distribution.

In the interests of the long-term preservation of Sri Lanka's biological diversity, it will be important to check that the minimum set of sites identified by means of the iterative approach contains the full range of physical environments, particularly given the likelihood of significant global climatic changes over the next century.

2.3 CONSTRAINTS

The number of species is not an adequate measure of biological diversity because speciation is not necessarily correlated with ecological differentiation (Bond, 1989). Thus, the species in a genus or higher taxonomic unit may be ecologically monotonous. In contrast to large genera with many ecologically similar species is the case in which extraordinary variability is found within a single species, perhaps necessitating conservation of individual populations throughout its entire range. In order to prioritise the selection of protected areas networks for biological diversity conservation, taxonomic distinctness needs to be measured in addition to species richness and complementarity (Vane-Wright *et al.*, 1991a).

Species richness (number of species) and complementarity (i.e. relative contributions of individual biotas to the network) are incorporated in the existing conservation evaluation procedure (Section 2.2.2). Thus, the ideal first choice is the site having the most species (or rare species); subsequent sites are selected on the basis of their representation of the residual complement. The model does not, as yet, take into account taxonomic distinctness, the difference between species in relation to their place in the natural hierarchy. This can be evaluated by root weighting, whereby species are weighted for distinctness according to their position in the taxonomic hierarchy (Vane-Wright *et al.*, 1991b). Systems are being developed which will enable taxic diversity measures to be combined with complementarity for a range of different organisms. It may be possible to apply them during the life of this Project.

3. SAMPLING BIOLOGICAL DIVERSITY IN SRI LANKA'S FORESTS

3.1 INTRODUCTION

These guidelines provide the basis for estimating the biological diversity represented within natural forests (including mangroves) and related patanas (i.e. montane grasslands), as specified in the Project Document (FAO, 1989). They are written in the light of experience gained in surveying natural forests but they can be applied to montane grasslands (and other habitat types) with minimal modification.

The sampling procedure involves the following steps, each of which is described in the sections below:

- identification of study sites,
- positioning of transects and plots along environmental gradients, and
- inventorying of flora and fauna within plots.

3.2 CRITERIA FOR SELECTING FORESTS TO SURVEY

The new 1:500,000 Forest Map of Sri Lanka (Legg and Jewell, 1992)[7] provides the basis for identifying areas of remaining natural forest (including mangrove). Boundaries of forest and proposed reserves, together with protected areas under the jurisdiction of the Department of Wildlife Conservation, are marked on this map reproduced at a scale of 1:100,000. This enables those forests which are notified under either the Forest Ordinance, National Heritage Wilderness Areas Act, or Fauna & Flora Protection Ordinance to be distinguished from other state forests that lack any legal protection.

The National Conservation Review covers all natural forests administered by the Forest Department (i.e. forest reserves, proposed reserves and national heritage wilderness area) and by the Department of Wildlife Conservation (i.e. national reserves and sanctuaries). It includes the 30 forests previously surveyed under the Accelerated Conservation Review (TEAMS, 1991), in which sampling was not systematic. In the case of proposed reserves and other state forests, only those exceeding 100 ha[8] in size are surveyed unless they are known to be of particular biological importance.

3.3 GRADSECT SAMPLING

Transects are oriented along environmental gradients in order to sample the full range of biological diversity within a forest. Altitude has been selected as the main environmental variable for the purposes of the National Conservation Review, as mentioned in Section 2.2.1. Reference to the 1:63,630 series of topographic maps enables transects to be positioned at right angles to contours, ensuring that the full range of altitudes and aspects is covered by one or more transects within each forest (Figure 1a). In the case of extensive forests, Landsat Thematic Mapper false-colour images (scale 1:50,000) are used to differentiate between community types and ensure that each is sampled. While large-scale maps of the soil and vegetation may help in deciding where to align transects, such information is not available for the majority of forests. Aerial photographs may also be useful.

---

[7]This was not available at the start of the National Conservation Review. Thus, forests in Galle, Matara and Hambantota districts were identified from the 1:100,000 Land Use series.

[8]A threshold of 50 ha was applied to Galle, Matara and Hambantota districts at the outset of the National Conservation Review, but this was later raised to 100 ha to expedite the survey.

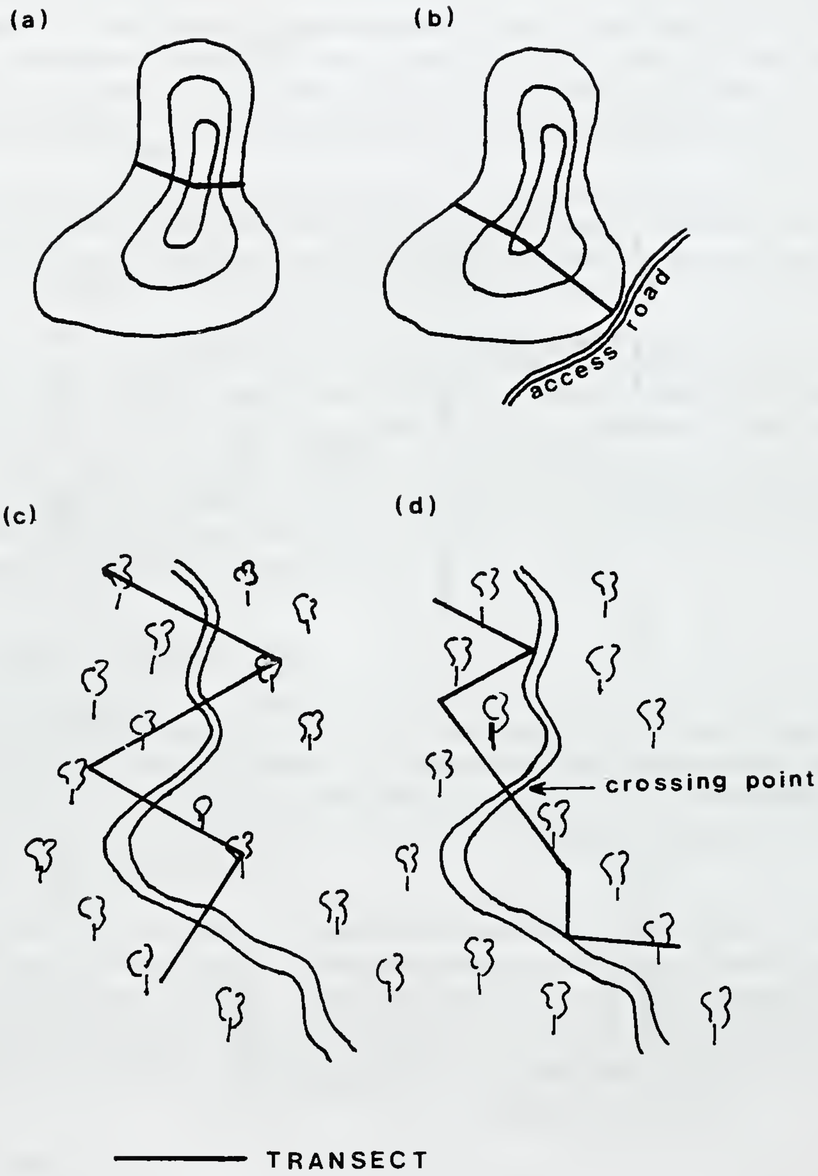


Figure 1 Transects are aligned along altitudinal gradients (a), taking advantage of access routes as appropriate (b). Narrow belts of vegetation, such as riverine forest, may be sampled in a zigzag direction (c), crossing between banks as conditions permit (d).

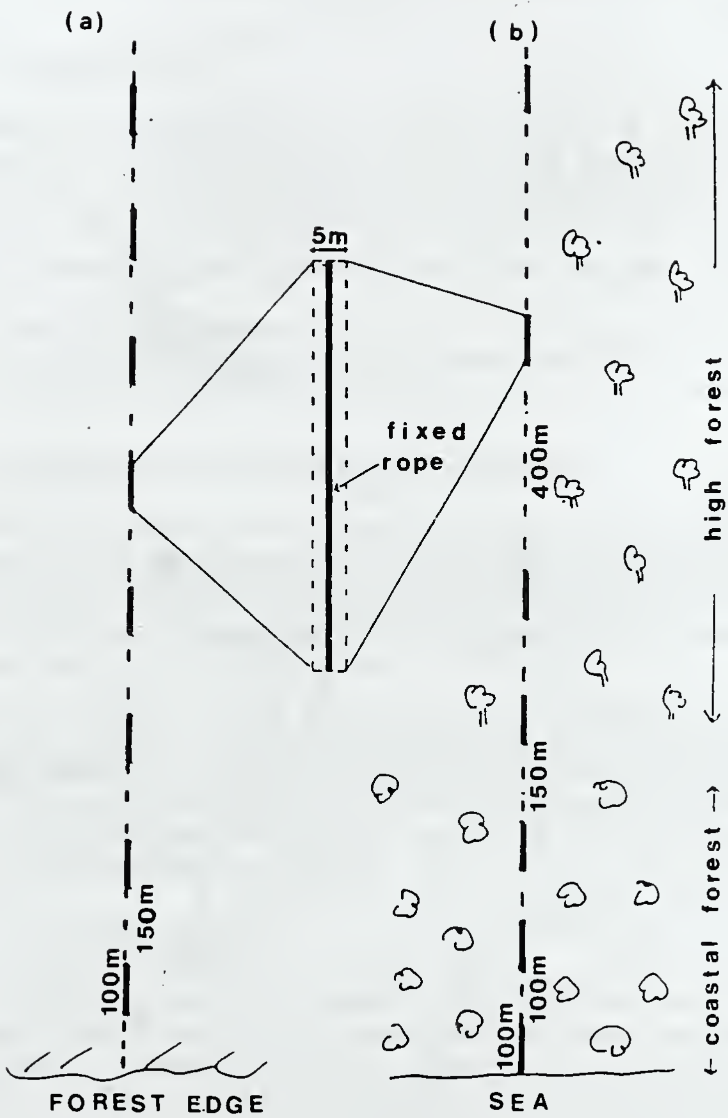


Figure 2 Schematic diagram of plots aligned along transects at regular intervals in wet zone (a) and dry zone (b) forests (not to scale)

Transects need not follow a straight line, but can change direction to maximise variability between plots and to enhance accessibility as necessary (Figure 1b). An effective way of sampling narrow bands of forest, such as riverine or coastal vegetation, is to run transects in a zigzag along the width of the forest (Figure 1c,d). A single transect with at least five plots should be adequate for sampling small forests of about 100 ha, but up to four or five transects may be required for those of about 10,000 ha, particularly in the case of rain and sub-montane forest where species diversity is higher. Having fixed the transect(s) on the map, the site is visited and any slight modifications to the original bearing are made before setting off along the transect. The transect is walked along fixed bearing(s) using a compass, with plots of 100 x 5 m placed at regular intervals.

Transects and plots are permanently marked so that they can be revisited for checking data or carrying out further fieldwork. Trees are marked with yellow paint at 10-20 m intervals. The paint is applied to one side of trees between plots and to both sides within plots. Plots are further distinguished by means of coloured nylon rope tied out of reach round a branch of the first and last tree in each plot.

The first plot is positioned at the beginning of the transect when starting on the coast, in a valley or on a ridge, but it should otherwise be placed 100 m inside the perimeter of the forest to avoid peripheral, disturbed areas. Plots are spaced 150 m apart (i.e. 4 plots per km of transect), the distance between plots being paced. This is generally adequate in rain forest and/or steep terrain, where species composition is fairly heterogeneous (Figure 2a). Plots may need to be spaced up to 400 m apart (i.e. 2 plots per sq.km) in the dry zone when the topography is fairly uniform (i.e. level terrain) and there are extensive patches of relatively homogenous forest (Figure 2b). Spacing of plots should not exceed 400 m because of the high investment in time and energy required to walk the transect. Occasionally, it may be necessary to space plots as little as 100 m apart, as in the case of narrow bands of coastal vegetation (Figure 2b).

3.4 SAMPLING WITHIN PLOTS

Plots are 100 m long, aligned along the length of the transect, and 5 m wide (Figure 2). They are measured along the centre-line using a brightly-coloured nylon rope, which changes from one colour to another at its mid-point (50 m) to facilitate sampling (see below). The exact location of each plot is determined from a Global Positioning System (GPS)[9]. As dense canopy cover interferes with the receiver, it is often necessary to climb a tree in order to obtain an unobstructed fix from the satellites. Various physical parameters are measured at 0 m, 50 m and 100 m intervals along the plot and recorded on the Plot Description Form (Annex 1). The condition of the vegetation is also assessed.

The fauna and flora within each plot are recorded on the Species Inventory Form (Annex 2). Noteworthy species seen along the transect but outside the plots may also be recorded, but such data are not used in the analyses. Inventory forms with a check-list of species and their codes are automatically generated from EIMS, based on inventories of one or more forests previously surveyed. This saves time writing species' names in the field and speeds up data entry by using the species' codes. The time required to inventory the species within each plot ranges from less than 1 hour in dry monsoon forest to 2-3 hours in rain forest.

3.4.1 Fauna

The plot is first walked by the zoologist who records all vertebrate animals seen or heard within the range of visibility - this takes up to 30 minutes. The zoologist is followed by his assistant carrying the 100 m length of rope, and by a painter who marks both sides of trees at 10-20 m intervals along the centre-line. The zoologist and his assistant then retrace their footsteps either side of the fixed rope, disturbing the leaf litter and undergrowth as necessary to record animals, their tracks and signs within a 5 m belt (i.e. up to 2.5 m either side of the fixed rope). The edge of the plot is determined using a 2.5 m long stick held at right angles either

---

[9] As this was not available at the start of the National Conservation Review, plots in Galle, Matara and Hambantota districts were marked on topographic maps (1:63,630) and the geographic coordinates obtained.

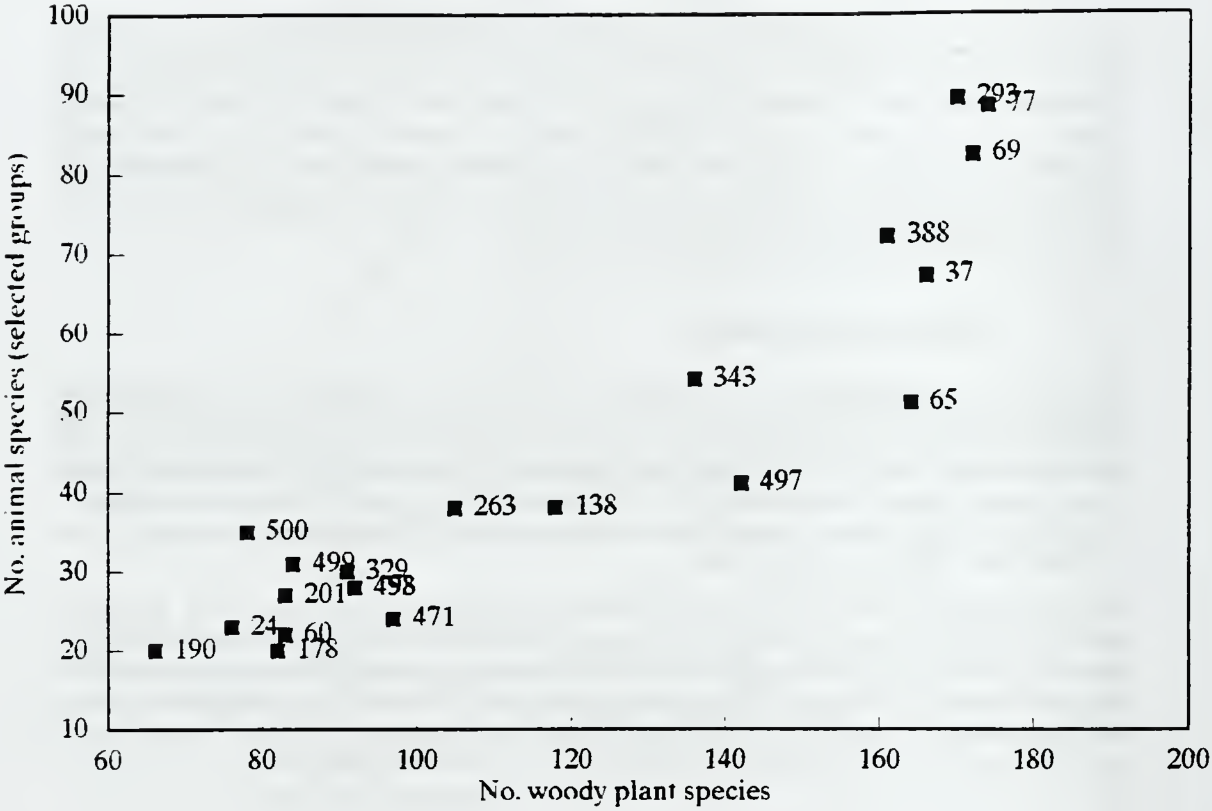
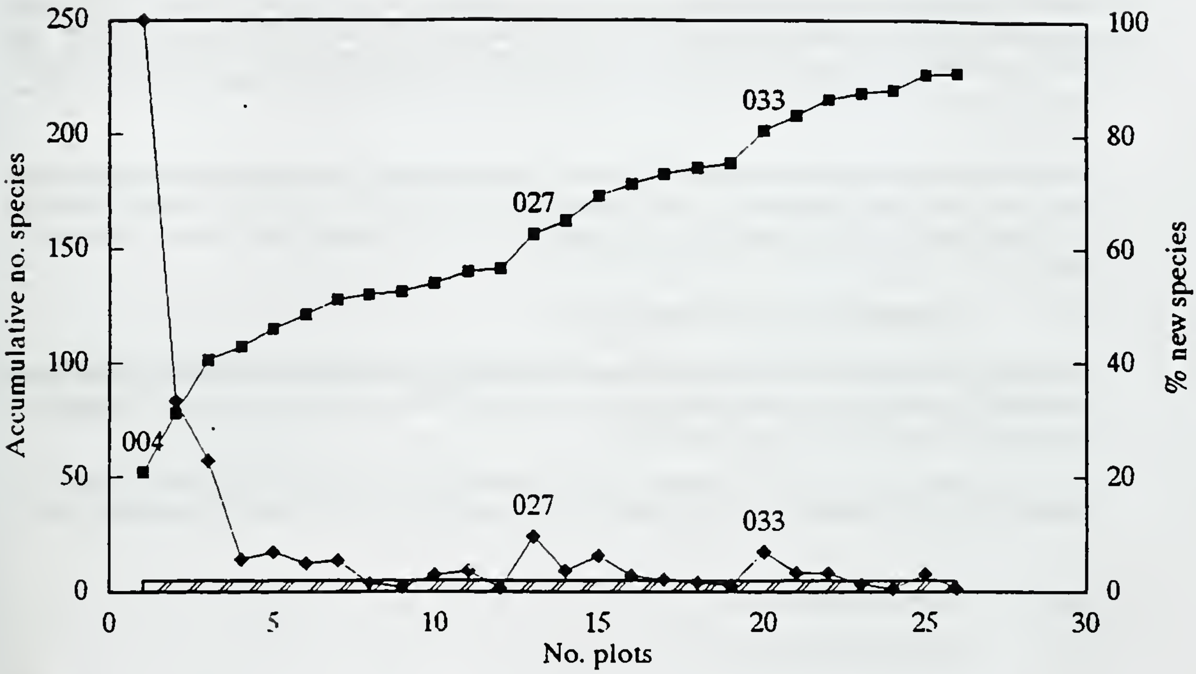


Figure 3 Relation between animal and plant diversity in natural forest, based on data from Matara District. Data points are labelled by protected area number.



Accumulative no. species

(No. new species/Accum. no. species)x100

5% threshold for new species

NOTE: Transect numbers are marked on the graphs for the first plot only.

Figure 4 Species/area curve for gradsects in Sinharaja. Sampling is considered adequate once the number of new species falls below the 5% threshold for at least two consecutive plots.

side of the fixed rope.

The faunal survey is restricted to mammals, birds, reptiles, amphibians and a few invertebrate groups (butterflies, molluscs and those species of termites which build mounds). Fishes are recorded opportunistically, as time and conditions permit. Species are recorded on a presence or absence basis from their tracks and signs, but the number of individuals is recorded in the case of direct observations. For termites, the number of termite mounds is recorded for two easily distinguished genera, *Odontotermes* and *Eutermes* (Annex 2).

3.4.2 Flora

Once the centre-line of the plot is fixed by the rope, the botanist walks along the length of the plot recording all woody plant species within a 5 m width (i.e. up to 2.5 m either side of the fixed rope, measured with a stick). Specimens of unidentified species are collected and numbered for subsequent identification at the National Herbarium. The number of individuals exceeding 10 cm DBH is recorded for each species, but species with no individuals exceeding 10 cm DBH are recorded only on a presence/absence basis (Annex 2). The botanist is assisted by one person who checks the width of the plot using a 2.5 m-long stick and who collects, labels and presses the herbarium material. Trees may have to be climbed to collect suitable herbarium specimens.

The floral survey is restricted to woody plants because of time constraints. It is of similar duration to the faunal survey, but tends to take less time in dry zone forest and longer in rain forest. In order to maximise efficiency, the first of either the floral or faunal parties to complete the plot travels along a fixed bearing to the next plot, marking trees on one side only with paint as it proceeds.

3.5 OBSERVATIONS BETWEEN PLOTS

Noteworthy fauna and flora observed along a transect while walking between plots are recorded, and specimens collected if their identity is uncertain. Such data are entered into EIMS, but are not used in any of the analytical procedures because this would bias the results.

The use of faunal, floral and land resources is also recorded along the length of each transect (Annex 3). Frequency of use is recorded up to a maximum of 10, more frequent use of a resource is recorded as 10+.

3.6 CONSTRAINTS

3.6.1 Sampling faunal diversity

Given the rapidity with which it is necessary to survey forests because of overall time constraints, analyses are based on the plant data and supplemented by the animal data. This is necessary because faunal diversity cannot be adequately sampled without re-visiting sites at different times of day and in different seasons, which is well beyond the scope of the National Conservation Review.

For analysis purposes, it is assumed that plant and animal diversity are strongly correlated: forests rich in woody plant species can be expected to be rich in animal species. This is demonstrated in Figure 3 using data from Matara District. Despite the limitations of the animal data, which are far from comprehensive, the correlation is extremely good.

3.6.2 Sampling adequacy

The adequacy of sampling for species diversity is routinely assessed in the field by constant reference to the relationship between the accumulative number of woody plant species recorded and the total area sampled. Once the asymptote is reached, the majority of species will have been recorded and sampling is discontinued for that particular forest. In practice, sampling continues until the number of new species of woody plants recorded within at least 2 successive plots does not exceed 5% of the total number of species.

An example of a species/area curve derived from data for Sinharaja, where fieldwork is ongoing, is shown in Figure 4. Further transects will reveal whether or not the asymptote has been reached at about 230 species. It is instructive to note that this total, recorded within 1.3 ha (26 plots), is well in excess of the 184 species recorded by Gunatilleke and Gunatilleke (1981) within a total area of 15 ha. They found that a minimum area of 3.75 ha was required to sample woody plants in the rain forests of Sinharaja. Such comparisons provide an indication of the cost-effectiveness of gradsect sampling.

The methodology is based on the premise that surveys of forests are comprehensive, with the full range of species sampled. In practice, this condition is unlikely to be met because of the limited resources available to survey all remaining natural forest in the country, particularly in the case of tropical rain and sub-montane forests where biological diversity is extremely high. Use of satellite imagery can help to ensure that transects pass through the full range of community types represented within each forest (see Section 3.3). Some gaps in the data can be filled by reference to published material and unpublished sources but such data must not be mixed with field data in any comparative analyses of forests because the results would be biased. Ultimately, the results of the National Conservation Review represent a preliminary attempt to assess the status and distribution of Sri Lanka's flora and fauna, thereby enabling an optimum protected areas network to be identified for the conservation of this biological diversity.

REFERENCES

Austin, M.P. (1978). Vegetation. In *Land use on the south coast of New South Wales*, eds Austin, M.P. and Cocks, K.D. CSIRO, Melbourne. Pp. 44-46.

Austin, M.P. Cunningham, R.B. and Fleming, P.M. (1984). New approaches to direct gradient analysis using environmental scalars and statistical curve-fitting procedures. *Vegetatio* 55: 11-27.

Austin, M.P. and Heyligers, M.P. (1989). Vegetation survey design for conservation: gradsect sampling of forests in north-eastern New South Wales. *Biological Conservation* 50: 13-32.

Austin, M.P. and Heyligers, M.P. (1991). New approaches to vegetation survey design: gradsect sampling. In *Nature conservation: cost effective biological surveys and data analysis*, eds C.R. Margules and M.P. Austin. CSIRO, Australia. Pp. 31-36.

Baldwin, M.F. (Ed.) (1992). *Natural resources of Sri Lanka: conditions and trends.* Natural Resources, Energy and Science Authority of Sri Lanka, Colombo. 280 pp.

Batisse, M. (1986). Developing and focusing the biosphere reserve concept. *Nature and Resources* 12: 2-11.

Bond, W.J. (1989). Describing and conserving biotic diversity. In *Biotic diversity in Southern Africa*, ed. Huntley, B.J. Oxford University Press, Oxford. Pp. 2-18.

Braatz, S. (1992). Conserving biological diversity: a strategy for protected areas in the Asia-Pacific region. *World Bank Technical Paper No.* 193. 66 pp.

Burbidge, A.A. (1991). Cost constraints on surveys for nature conservation. In *Nature conservation: cost effective biological surveys and data analysis*, eds C.R. Margules and M.P. Austin. CSIRO, Australia. Pp. 3-6.

FAO (1989). Project document: environmental management in forestry developments. Mission Report SRL/89/012. 90 pp.

Ferrar, A.A. (1989). The role of red data books in conserving biodiversity. In *Biotic diversity in Southern Africa*, ed. Huntley, B.J. Oxford University Press, Oxford. Pp. 137-147.

Frankel, O.H. (1983). Evolutionary changes in small populations. In *Conservation biology: an evolutionary - ecological perspective*, eds Soule, M.E. and Wilcox, B.A. Sinauer, Mass. Pp. 135-149.

Gillison, A.N. and Brewer, K.R.W. (1985). The use of gradient directed transects or gradsects in natural resources surveys. *Journal of Environmental Management* 20: 103-127.

Gunatilleke, C.V.S. and Gunatilleke, I.A.U.N. (1981). The floristic composition of Sinharaja - a rain forest in Sri Lanka with special reference to endemics and dipterocarps. *Malaysian Forester* 44: 386-396.

Howard, P.C. (1991). Guidelines for the selection of forest nature reserves and their application nationally and locally. In *Nature conservation in tropical forests: principles and practice*, ed. Howard, P.C. Forest Department, Kampala. Pp. 69-85.

Hunter, M.L. Jr, Jacobsen, G.L. Jr, and Webb, T. Jr (1988). Paleoecology and the coarse-filter approach to maintaining biological diversity. *Conservation Biology* 2: 375-385.

IUCN (1980). *World conservation strategy: living resource conservation for sustainable development.* IUCN/UNEP/WWF, Gland, Switzerland. 44 pp.

IUCN (1992). Requirements for the preparation of management plans for nine wet zone conservation forests - Sri Lanka. A proposal submitted to the Forest Department, Ministry of Lands, Irrigation and Mahaweli Development. IUCN, Colombo. 56 pp.

Kirkpatrick, J.B. (1983). An iterative method for establishing priorities for the selection of nature reserves: an example from Tasmania. *Biological Conservation* 25: 127-134.

Kirkpatrick, J.B. and Brown, M.J. (1991). Planning for species conservation. In *Nature conservation: cost effective biological surveys and data analysis*, eds C.R. Margules and M.P. Austin. CSIRO, Australia. Pp. 83-89.

Leader-Williams, N., Harrison, J. and Green, M.J.B. (1990). Designing protected areas to conserve natural resources. *Science Progress* 74: 189-204.

Legg, C. and Jewell, N. (1992). A new 1:500,000 scale forest map of Sri Lanka. Forest and Land Use Mapping Project, Forest Department, Colombo. 12 pp.

Mackey, B., Nix, H.A., Stein, J.A., Cork, S.E. and Bullen, F.T. (1989). Assessing the representativeness of the wet tropics of Queensland World Heritage Property. *Biological Conservation* 50: 279-303.

MacKinnon, J., MacKinnon, K., Child, G. and Thorsell, J. (1986). *Managing protected areas in the tropics.* IUCN, Gland, Switzerland and Cambridge, UK. 295 pp.

Mayr, E. (1969). *Principles of systematic zoology.* McGraw-Hill, New York. pp.

Margules, C.R. (1989). Introduction to some Australian developments in conservation evaluation. *Biological Conservation* 50: 1-11.

Margules, C.R., Nicholls, A.O. and Pressey, R.L. (1988). Selecting networks of reserves to maximise biological diversity. *Biological Conservation* 43: 63-76.

Margules, C.R., Pressey, R.L. and Nicholls, A.O. (1991). Selecting nature reserves. In *Nature conservation: cost effective biological surveys and data analysis*, eds C.R. Margules and M.P. Austin. CSIRO, Australia. Pp. 90-97.

Margules, C.R. and Usher, M.B. (1981). Criteria used in assessing wildlife conservation potential: a review. *Biological Conservation* 21: 79-109.

McNeely, J.A. (1988). *Economics and biodiversity: developing and using economic incentives to conserve biological resources.* IUCN, Gland, Switzerland. 236 pp.

McNeely, J.A., Miller, K.R., Reid, W.V., Mittermeier, R.A. and Werner, T.B. (1990). *Conserving the world's biological diversity.* IUCN, Gland, Switzerland; WRI, CI, WWF-US, and the World Bank, Washington, DC. 193 pp.

Nicholls, A.O. (1991). Examples of the use of generalised linear models in analysis of survey data for conservation evaluation. In *Nature conservation: cost effective biological surveys and data analysis*, eds Margules, C.R. and Austin, M.P. CSIRO, Australia. Pp. 54-63.

Sayer, J.A. and Whitmore, T.C. (1991). Tropical moist forests: destruction and extinction. *Biological Conservation* 55: 199-213.

Soule, M.E. (1983). Applications of genetics and population biology: the what, where and how of nature reserves. In *Conservation, science and society.* Unesco-UNEP. Pp. 252-264.

Soule, M.E. (1987). *Viable populations for conservation.* Cambridge University Press, Cambridge. ??? pp.

Soule, M.E. and Wilcox, B.A. (1980). *Conservation biology: an evolutionary - ecological perspective.* Sinauer, Sunderland, Mass. 393 pp.

TEAMS (1991). Review of forest management plans for environmental conservation. 2 volumes. Final report to Forestry Planning Unit, Ministry of Lands, Irrigation and Mahaweli Development. TEAMS, Colombo.

Usher, M.B. (Ed.)(1986). *Wildlife conservation evaluation.* Chapman and Hall, London. 394 pp.

Vane-Wright, R.I., Humphries, C.J. and Williams, P.H. (1991a). Biodiversity reserves: setting new priorities for the conservation of wildlife. *Parks* 2: 34-38.

Vane-Wright, R.I., Humphries, C.J. and Williams, P.H. (1991b). What to protect? - systematics and the agony of choice. *Biological Conservation* 55: 235-254.

Wilcox, B.A. (1984). *In situ* conservation of genetic resources: determinants of minimum area requirements. In *National parks, conservation and development: the role of protected areas in sustaining society*, eds McNeely, J.A. and Miller, K.A. Smithsonian Institution Press, Washington, DC. Pp. 639-647.

Wijesinghe, L.C.A. de S., Gunatilleke, I.A.U.N., Jayawardana, S.D.G., Kotagama, S.W. and Gunatilleke, C.V.S. (1989). *Biological conservation in Sri Lanka (a national status report).* Natural Resources, Energy & Science Authority of Sri Lanka, Colombo. 64 pp.

Wilson, E.O. and Francis, M.P. (Eds) (1988). *Biodiversity.* National Academy Press, Washington, DC. 521 pp.

World Conservation Monitoring Centre (1992a). *Global biodiversity: status of the Earth's living resources.* Chapman & Hall, London. 594 pp.

World Conservation Monitoring Centre (1992b). Assessing the conservation status of the world's tropical forest: a contribution to the FAO Forest Resources Assessment 1990 (Draft). World Conservation Monitoring Centre, Cambridge, UK. 662 pp + 158 maps.

World Conservation Monitoring Centre (1992c). Conservation status listing: Sri Lanka. WCMC, Cambridge, UK. 47 pp.

Annex 1

PLOT DESCRIPTION FORM

DATE:
NAME OF SITE: NO. OF SITE: LEGAL DESIGNATION:
BRIEF DESCRIPTION OF SITE CONDITION:

TRANSECT/PLOT NO.										
GEOG. COORD. - LATITUDE - LONGITUDE										
TIME - START - END										
WEATHER - CLOUD COVER[1] - CONDITIONS[2]										
ALTITUDE (M) - MIN. - MAX.										
MEAN										
ASPECT @ 0M @ 50M @ 100M										
MEAN										
SLOPE (°) @ 0M @ 50M @ 100M										
MEAN										
VISIBILITY (°)[3] @ 0M @ 50M @ 100M										
MEAN										
FOREST FLOOR[4]										
CANOPY HEIGHT (M)										
CANOPY COVER[5]										
DISTURBANCE[6]										

1. 1/8, 2/8 etc.
2. 1 = dry
   2 = moist
   3 = wet
3. Mainly with respect to direct observation of mammals & birds
4. 1 = rocks
   2 = exposed
   3 = leaf litter
   4 = herbs
5. 0 = zero
   1 = 1-5%
   2 = 6-25%
   3 = 26-50%
   4 = 51-75%
   5 = 76-100%
6. 1 = undisturbed
   2 = slight disturbance (a few tree stumps evident)
   3 = disturbed (canopy intact but numerous tree stumps)
   4 = semi-degraded (up to 50% canopy removed)
   5 = degraded (>50% canopy removed)

Date of database entry:
Signed:

Annex 2

SPECIES INVENTORY FORM

DATE:
NAME OF SITE: NO. OF SITE: LEGAL DESIGNATION:

PLANTS[1]/ANIMALS[2] (delete as appropriate)

TRANSECT/ PLOT NO.										
SPECIES[3]										

[1] For plants, the number of individuals exceeding 10cm DBH is recorded for each species. A plus indicates the presence of a species but with no individual exceeding 10cm DBH.

[2] For animals, the number of individuals of all vertebrate groups except fishes (i.e. mammals, birds, reptiles and amphibians) and certain invertebrate groups (i.e. butterflies, molluscs and termites which build mounds) directly observed or heard is recorded. A plus sign indicates that a species is present. In the case of indirect observations the following code is used:

B = burrow D = defaecation F = feeding sign H = heard
L = lying site R = rubbing site T = tracks

[3] Species identified in the field are recorded by their scientific name or species code. Unidentified species are collected for subsequent classification and recorded by their accession or herbarium number.

Date of database entry:
Signed:

Annex 3

RESOURCE USE DESCRIPTION FORM

NAME OF SITE: . . NO. OF SITE:
TRANSECT NO: TRANSECT LENGTH: . km DATE:

RESOURCE USE TYPE	FREQUENCY	SPECIES	OBSERVATIONS
ANIMAL PRODUCTS			
HONEY (illicit)			
MEAT-HUNTING (illicit) - guns - dogs - gun trap - pitfall trap - deadfall trap - noose - sprung noose			
OTHER (specify)			
LAND CONVERSION			
CHENA (illicit) - temporary (1/2 yrs) - permanent			
MINING (illicit) - gemming - other (specify)			
PLANTATION - tea - other (specify)			
SETTLEMENT - temporary (wadia) - permanent			
WILDFIRE (in last 1-2 yrs) - deliberate - natural - unknown			
OTHER (specify)			
PLANT PRODUCTS			
BAMBOO - licit - illicit - unknown			
BARK (illicit)			
FOOD - fruit - root - other (specify)			
FUELWOOD (illicit)			
KITUL - licit - illicit - unknown			
MEDICINE - fruit - root - other (specify)			
RATTAN - licit - illicit - unknown			
RESIN (illicit)			
TIMBER (EX SITU) - licit - illicit - unknown			
TIMBER (IN SITU) - licit - illicit - unknown			
OTHER (specify)			

Date of database entry: Signed:

BIOLOGICAL DIVERSITY ASSESSMENT: AN EXAMPLE

This annex provides an assessment of the biological value of nine forests selected from Galle and Matara districts. It is based on preliminary plant data obtained as part of the National Conservation Review. The data are held in the Environmental Information Management System (EIMS), maintained by the Environmental Management Division, Forest Department. EIMS is capable of performing a range of analyses, including those featuring here.

1. BIOLOGICAL DIVERSITY SUMMARY

The total number of woody plant species recorded within each forest is given in Table 1, together with various other statistics concerning levels of endemicity and threat. Diyadawa, for example, has the most species, as well as endemic species, but the forest with most unique species is Kalubowitiyana. Kekanadura has fewest species, none of which is unique to this site. Similar statistics can be generated for animals recorded within these forests.

Table 1 Summary of woody plant species diversity for selected forest in Galle and Matara districts. Unique species are those recorded only within a single forest. Nationally threatened species are those listed as such by Wijesinghe *et al.* (1989); globally threatened species are those registered as such by WCMC (1992c).

					Species			Threatened species	
No	Forest	Families	Genera	Species	Unique	Endemic	Un/End.	National	Global
497	Kalubowitiyana	116	119	142	19	48	1	6	4
37	Beraliya (Akuressa)	119	121	166	13	82	7	15	6
69	Dellawa	132	134	172	10	80	5	8	5
77	Diyadawa	128	129	174	7	85	2	15	6
178	Kanumuldeniya	71	73	82	4	36	0	5	3
190	Kekanadura	63	63	66	0	25	0	4	3
263	Masmullekele	89	90	105	5	43	1	7	4
329	Oliyagankele	73	75	91	5	50	3	9	6
388	Rammalakanda	123	126	161	18	72	7	13	9

2. DEFINING AN OPTIMAL NETWORK OF FORESTS

Two procedures have been developed within EIMS to use species' distribution patterns to identify a minimum number of forests in which all species are represented. The first method ranks forests in order of their contribution of species to the network (Table 2). Thus, the forest selected first in this example is Diyadawa, the one which is richest in species. Beraliya is ranked as second because, of the remaining forests, it has the highest number of additional species not already represented in the first site, and so on. The analysis demonstrates that eight of the nine forests need to be conserved in order that each species is represented in the network. Kekanadura does not contribute any additional species to the network, all of its species being found in one or more of the other forests. Various criteria can be applied to the model. For example, it may be desirable to ensure that each species is represented in at least two forests, or it may be necessary to consider only endemic species due to socio-economic constraints.

Table 2 Minimum network of forests requiring protection in order to conserve 314 species of woody plants. Forests are ranked according to their contribution, in terms of woody plant species, to the network.

			Species represented in network				Unrepresented species
Rank	No	Forest	New	% New	Cumulative No.	% Total	Total
1	77	Diyadawa	174	55.4	174	55.4	140
2	37	Beraliya (Akuressa)	52	16.6	226	72.0	88
3	497	Kalubowitiyana	35	11.1	261	83.1	53
4	388	Rammalakanda	22	7.0	283	90.1	31
5	69	Dellawa	11	3.5	294	93.6	20
6	178	Kanumuldeniya	10	3.2	304	96.8	10
7	263	Masmullekele	5	1.6	309	98.4	5
8	329	Oliyagankele	5	1.6	314	100.0	0
9	190	Kekanadura	0	0	314	100.0	0

The second method weights for rarity by ranking forests in order of their contribution of rare species to the network. In this example, Kalubowitiyana is ranked highest (Table 3) because it contains most rare species, despite its species diversity being lower than for some of the other forests (see Table 1). Diyadawa, the most species-rich forest, is ranked fifth.

Table 3 Minimum network of forests requiring protection in order to conserve 314 species of woody plants. Forests are ranked according to their contribution of rare (i.e. unique) species of woody plants to the network.

			Unique	Species represented in network				Unrepresented
Rank	No	Forest	Species	New	% New	Cum No.	% Total	Species
1	497	Kalubowitiyana	19	142	45.2	142	45.2	172
2	388	Rammalakanda	18	68	21.7	210	66.9	104
3	37	Beraliya	13	51	16.2	261	83.1	53
4	69	Dellawa	10	24	7.6	285	90.8	29
5	77	Diyadawa	7	9	2.9	294	93.6	20
6	263	Masmullekele	5	7	2.2	301	95.9	13
7	329	Oliyagankele	5	6	1.9	307	97.8	7
8	178	Kanumuldeniya	4	7	2.3	314	100.0	0
9	190	Kekanadura	0	0	0	314	100.0	0

This example demonstrates just a few of the analyses to which species data can be subjected. Procedures can be modified according to conservation priorities and constraints on land use as appropriate.

NOTES

PART B

SOIL CONSERVATION AND HYDROLOGY

1. IMPORTANCE OF FORESTS FOR SOIL CONSERVATION AND HYDROLOGY

1.1 INTRODUCTION

Forests contribute to the stability of watersheds by protecting the soil surface from the direct impact of intensive tropical rain storms. Rainfall is intercepted by the vegetation canopy and the balance falls on the forest floor. Additional storage is provided by organic litter and the surface soil, which are very porous due to the action of roots and the soil fauna. Water rapidly percolates vertically into the subsoil and drains laterally into the streams.

The removal of forest cover exposes the soil to erosion and compaction. Reduced vegetation cover allows more water to reach the soil more rapidly. Less infiltration caused by surface sealing and compaction increases surface run-off and, hence, erosion which quickly reduces the depth of the soil and its capacity to store water. For example, an average of 300 mm of soil has been lost from Sri Lanka's upper Mahaweli watershed during the last 100 years (Krishnarajah, 1982), thereby reducing the capacity of the soil profile to store water by about 60 mm. With increasing surface run-off, the ground water table is progressively lowered and processes of desertification set in. Steep hill sides become more prone to landslides as tree roots rot, perennial streams become ephemeral (intermittent), and floods more frequent with increased surface run-off and accumulating sediment in the river beds. Inevitably, the repercussions of increased sediment loads and higher flood peaks are experienced kilometres downstream from the deforested headwaters. In the long term, sedimentation of reservoirs may substantially reduce their capacity to store water for hydropower and irrigation, jeopardizing the ago-industrial base of the economy.

1.2 TROPICAL FORESTS AND SOIL CONSERVATION

Deforestation is a major cause of soil erosion in many tropical countries. The popular view that trees check soil erosion, particularly when planted in stands, is scientifically proven. Besides erosion, deforestation can lead to various problems downstream, such as reservoir siltation, sedimentation of irrigation works, and higher flood peaks.

It is necessary to distinguish between surface erosion, gully erosion and landslides because the ability of forests to control these various types of erosion differs considerably. In a review of 80 studies of surface erosion in tropical forests and tree crop systems, Wiersum (1984) concluded that surface erosion is negligible in those systems where the soil surface is adequately protected from the impact of raindrops by a well-developed litter and herb layer. Erosion is slightly higher if the understorey is removed, but rises dramatically with the removal of the litter layer. Studies in India have shown that sediment loads are about five times higher in deforested than forested catchments (Haigh *et al.*, 1990). In Kanneliya, which lies in Sri Lanka's wet zone, it has been shown that sediment loads are lower (0.15 t ha^{-1} yr^{-1}) for natural forest than selectively logged forest (0.27 t ha^{-1} yr^{-1}) (Ponnadurai *et al.*, 1977). Sediment loads for pines (0.49 t ha^{-1} yr^{-1}) and grasslands (3.3 t ha^{-1} yr^{-1}) are still higher (Gunawardena, 1989a), but nowhere near the high loads (100 t ha^{-1} yr^{-1}) recorded from formerly forested, badly managed agricultural land (Stocking, 1984).

Accelerated soil erosion on hill sides shortens the effective life span of reservoirs. A study of 17 major reservoirs in India, for example, shows that they are filling at about three times the expected rate because of the vast areas deforested (Tejwani, 1977). Similarly, high rates of siltation (13,500 m^3 km^{-2} yr^{-1}) have been recorded from deforestation in Tanzania (Kunkle and Dye, 1981). In Sri Lanka, serious concern was expressed in 1873 about soil erosion caused by indiscriminate conversion of forest for plantation agriculture. A recent study shows that 15 millions tons of sediment passed through the Peradeniya gauging station in the upper Mahaweli watershed during the period 1952-1982 (NEDECO, 1984). Almost 44% of the capacity of the Polgolla Barrage, sited about 4 km downstream from this station, was silted by 1988, only 13 years after its commissioning (Perera, 1989). There is every indication that the reservoirs built under the Accelerated Mahaweli Development Project are silting up at a much faster rate than predicted at the feasibility stage.

Hill roads cause many landslides and are a major source of sediment. It has been estimated that roads in the Central Himalaya produce 430-550 m3 km^{-1} yr^{-1} of sediment (Haigh *et al.*, 1990). Similarly, studies carried out in Sri Lanka have identified landslides as a major source of sediment (Gunawardena, 1987).

1.3 HYDROLOGICAL IMPORTANCE OF TROPICAL FORESTS

The influence of forests on the hydrological cycle has been studied for a long time, but many contradictory views persist. While there is general agreement about the beneficial effect of forest on microclimate, air and water purification processes, and control of run-off and erosion, the influence of forest and forest reclamation on the water balance within a region remains the subject of much controversy. The way in which forest influences rainfall, water yield and flooding is discussed in the following three sections.

1.3.1. Rainfall

Opinions differ regarding the effect of forest on rainfall. Some authorities maintain that forest has marginal effect on rainfall, while others consider that the removal of forest results in desertification. The consensus among hydrologists is that changes in land use have no effect on rainfall, except in extensive areas such as the tropical watersheds of the Congo and Amazon (Bruijnzeel, 1986; Meher-Homji, 1988; Pereira, 1989).

Although the impact of deforestation on rainfall is contentious and difficult to quantify at present, there is rather more agreement about its repercussions on storm intensity and associated soil erosion (Meher-Homji, 1988). Dickenson (1980) reviewed a number of studies and concluded that deforestation could increase the intensity and reduce the duration of tropical rainfall, enhancing run-off without necessarily changing the total amount of rain falling during a given period. Long-term observations of private rubber plantations in Malaysia provide circumstantial evidence of profound and lasting changes arising from forest clearance (Unesco, 1978). Total rainfall remained unchanged following large-scale forest clearance: rainfall frequency decreased but its intensity increased. Similarly, Meher-Homji (1980) has shown that large-scale deforestation tends to reduce the number of rainy days rather than the total volume of the rainfall. The result is enhanced soil erosion and, consequently, a higher incidence of major disasters. If rainfall remains unchanged in total amount but becomes sporadic, with a higher incidence of torrential downpours, the consequences are more flooding and greater siltation of river beds and reservoirs. Greater erosion reduces the capacity of soils to store water, with the result that streams dry up more quickly if drought conditions persist.

1.3.2. Water yield

A common misconception is that the complex of forest soils, roots and litter behaves like a sponge, soaking up water during rainy spells and releasing it gradually during dry periods. Although forest soils generally have higher infiltration and storage capacities than soils with less organic matter, most of this water sustains the forest rather than stream flow. Moreover, appreciable quantities of rainfall (20%) are intercepted by the canopies of tropical forests, 30% in the case of wet zone forests in Sri Lanka (Ponnadurai *et al.*, 1977), and released back into the atmosphere.

Hibbert (1967) was the first to review the effect of forest clearance on water yield. On the basis of 39 studies, he concluded that: a) reduction of forest cover increases water yield, b) establishment of forest cover on sparsely vegetated land decreases water yield, and c) response to treatment is highly variable and, for the most part, unpredictable. Subsequent work by Bosch and Hewlett (1982), however, has shown that water yield can be predicted. They examined 94 case studies, including those reviewed by Hibbert, and concluded that coniferous forest, deciduous hardwood forest, brush and grass cover, in that order, have decreasingly less influence on water yield from the source area compared to bare ground which has none. Other work by Hamilton and King (1983) and by Oyabande (1988) supports these findings.

The only undisputed case of forests having a positive influence on water yield is along coastal belts and at high elevations where the incidence of cloud or fog is high. Such 'cloud' forests, which comprise almost 5% of the total area of closed moist tropical forest (Bruijzneel, 1986), intercept significant quantities of 'horizontal precipitation' from cloud or fog. Typically, in the humid tropics, this represents from 7-18% of normal, vertical precipitation recorded during rainy seasons to over 100% during dry seasons. Preliminary studies conducted at 2100 m in Sri Lanka have shown that cloud forests contribute an additional 17% of normal precipitation (Mowjood and Gunawardena, 1992). Thus, conversion of cloud forest to agricultural land in the humid tropics will cause a marked and usually irreversible reduction in stream flow and ground water storage. This, and the fact that they often constitute unique ecosystems, provides a strong case for their conservation.

1.3.3. Floods

Forest clearance in tropical uplands has often been considered to be the major cause of severe flooding, particularly in Asian countries such as northern India, China and the Philippines (Bruijzeel, 1986), and it is widely believed that upland forestation represents the solution to this pressing problem. On the other hand, Bosch and Hewlett (1982) concluded from their review of mainly North American research that deforestation does not significantly increase the volume of water flowing in large streams, although significant increases in stream flow usually occur in small streams and these are related to the proportion of the catchment area that is cleared.

It has been shown that the presence or absence of forest has little effect on the magnitude of flooding, which is mainly the result of too much rain in too short a time. The degree of flooding is also a function of basin and channel geometry.

Recent studies in the tropics still suggest, however, that afforestation greatly reduces flood peaks by reducing surface flow. Studies conducted at Kanneliya, in Sri Lanka's low-country wet zone, show that the ratio of run-off/rainfall was increased by 29% in a logged catchment (Ponnadurai *et al.*, 1977). Comparative studies conducted at Wewelthalawa in the mid-country wet zone show that pine plantations produce 48% less surface run-off compared to grasslands (Gunawardena, 1989b). Similarly, in India, deforestation may account for the increase in extent of flood prone land from 20 to 40 million ha in the ten years up to 1989 (Haigh *et al.*, 1988).

2. ASSESSING FORESTS FOR SOIL CONSERVATION AND HYDROLOGY

2.1 INTRODUCTION

The importance of forests for soil conservation and hydrology is assessed on the basis of the four criteria identified in the previous section as follows:

Soil Conservation
- soil erosion

Hydrology
- flood hazard
- protection of headwaters
- fog interception

Similar criteria have been identified by IUCN (1986) for the selection of areas in need of protection for their hydrological functions.

Whereas forest is entirely beneficial for the prevention of erosion, its presence has both positive and negative impacts on the hydrological cycle as discussed in Section 1.3. Thus, the importance of forest for soil conservation is given priority weighting over its hydrological value in the methodology.

2.2 SOIL EROSION

Two approaches to assess erosion at the reconnaissance level have been identified by Morgan (1980). The first is based on regional variations of various erosion indices, such as gully density and drainage density. The second uses rainfall to calculate an erosivity index based on kinetic energy. The latter, physically-based method has been universally accepted as a standard technique. It was used in a case study to assess the erosion risk of Peninsular Malaysia (Morgan, 1980). A similar procedure has been adopted in the present study to determine rainfall erosivity. In addition, some of the parameters usually considered in more detailed erosion assessment procedures are also incorporated in the methodology.

2.2.1 Assessment of the importance of forests for soil conservation

Soil erosion by water is influenced most by the amount of rainfall. In regions of very low mean annual rainfall, little erosion is caused by the rain running off the land because most of it is absorbed by the SOIL and vegetation. In other regions of very high rainfall (> 1000 mm yr^{-1}), as in Sri Lanka, dense forest typically develops which protects the soil from erosion by water. Removal of this natural forest cover usually results in severe erosion.

However, it is not only the amount of rainfall that affects soil erosion but also its intensity. The intense downpours characteristic of the tropics have a very greater impact than the gentler rains of temperate climates. The zone of intensive or 'destructive' rain lies between approximately 40^0 North and 40^0 South within which Sri Lanka is situated.

The severity of soil erosion also depends on the susceptibility of a given soil to erosion. This attribute of soil is influenced mostly by its physical characteristics, such as texture, structure, infiltration capacity and permeability. Soil structure is largely determined by the organic matter content of the soil: the higher the level of organic matter, the less susceptible the soil is to erosion.

Thus, the amount of erosion depends upon a combination of the power of the rain to cause erosion and the ability of the soil to withstand erosion (Hudson, 1981). In mathematical terms, soil erosion is a function of the erosivity of the rain and the erodibility of the soil, or

$$\text{Erosion} = f(\text{Erosivity})(\text{Erodibility}).$$

This relationship is expressed by the Universal Soil Loss Equation (USLE), developed by Wischmeir and Smith (1965) and widely accepted as a predictive equation to estimate the mean annual soil erosion. In its basic form, USLE is:

$$A = E.K. \qquad \text{.............. (1)}$$

where A = mean annual soil loss (t ha^{-1} yr^{-1}),
E = erosivity, and
K = erodibility.

Erosivity can be defined as the potential ability of the rain to cause erosion. For given soil conditions, one storm can be compared quantitatively with another based on a numerical scale of values of erosivity. Erodibility is defined as the vulnerability of the soil to erosion and, for given rainfall conditions, one soil condition can be compared quantitatively with another, based on a numerical scale of values of erodibility.

Erodibility has three components: first the fundamental or inherent characteristics of the soil, such as texture, structure and organic matter content, which can be measured in the laboratory; secondly, topographic features, especially the slope of the land; and thirdly, the way in which the soil is treated or managed. In the present study, the third factor is assumed to be a constant because the only type of land use under consideration is natural forest. Thus, the following equation is used to predict soil loss from natural forest:

$$A = E.K.S. \qquad \text{.............. (2)}$$

where S = slope factor.

Estimating rainfall erosivity

Rainfall erosivity is a function of the size and velocity of the rain drops. It can be predicted from its proven relationship with rainstorm intensity (Wischmeier and Smith, 1958; Hudson, 1981; Lal, 1976; Morgan *et al.*, 1982). But rainfall intensity data are not available in many countries, including Sri Lanka, due to a lack of recording rain gauge stations[1]. This problem can be overcome by developing models to predict rainfall erosivity from meteorological parameters, such as total annual rainfall and the Fournier Index, which are commonly available from non-recording rain gauge stations (Arnoldus, 1980).

A similar approach has been used in Sri Lanka (Premalal, 1986). Ten meteorological stations with recording rain gauges were selected to sample the mid- and up-country zone (i.e. above 300 m) and 12 for the low-country zone (i.e. below 300 m). An erosivity index was calculated using the procedure described by Hudson (1981). A regression equation was derived for the mid- and up-country to predict erosivity from mean annual rainfall, modified Fournier Index and altitude. For the low-country, it was found that mean annual rainfall alone is strongly correlated with erosivity.

However, these two equations for the mid/up-country and low-country zones can be used to estimate erosivity for a given forest only if it has a single value for altitude and lies within one zone. Consequently, the original data for mid-, up- and low-country were pooled and a multiple step-wise regression performed on erosivity with a variety of independent variables, including mean annual rainfall, modified Fournier Index and altitude. This showed that mean annual rainfall alone accounts for about 75% of the variation. The resultant regression equation is given below:

$$E = 972.75 + 9.95\ MAR, \quad (R^2 = 0.75) \qquad \text{.............. (3)}$$

---

[1]A recording rain guage automatically records the amount of rainfall with time.

where E = Erosivity ($J\ m^{-2}\ Yr^{-1}$), and
MAR = Mean annual rainfall (mm).

Two hundred and twenty 'station years' of rainfall data were used to derive the above equation. This is a considered to be an adequate sample size, being very much larger than the 11 'station years' of data used to derive a similar erosivity index for Peninsular Malaysia (Morgan, 1980). It should be emphasized that the above equation (3) is valid only for Sri Lanka.

An estimate of mean annual rainfall is a prerequisite to calculating erosivity for a given forest using equation 3. The isohyetal method (Linsley *et al.*, 1982) was used to estimate mean annual rainfall (see Annex 1) in preference to Theissen's polygon method of weighting which is not suitable, particularly in the case of smaller forests.

Estimating soil erodibility

The erodibility of the major soil types in Sri Lanka is given by Joshuwa (1977). Erodibility values are obtained from the soil map which is superimposed on the forest map in order to assign the respective erodibility value to each forest. This is necessarily crude because more detailed soil maps are not available.

The alternative of surveying soils within individual forests to obtain a more detailed information on soil type was not warranted in view of the time involved in obtaining adequate sample sizes. Furthermore, since there is only a twofold difference between the highest and lowest erodibility values of the major soils in Sri Lanka, more precise estimates would not make a significant difference to the overall assessment of the hydrological value of forests.

Determining slope factor

The mean slope is determined using the procedure described by Fleming (1975). Each forest is located on the 1:63,360 series of topographic maps and overlaid by a grid, effectively dividing it into smaller units. The perpendicular distance is measured from the contour at each grid point to the nearest stream (or paddy field when there is no stream in the vicinity). This value is divided by the altitudinal difference to derive the slope from which an arithmetic mean is obtained. The procedure, described in Annex 1, is modified in the case of dry zone forests where stream density is lower due to the reduced rainfall and to the terrain being less steep. In such cases, slope is estimated by dividing the difference in altitude between two points by the distance for a range of different aspects and calculating a mean value.

The slope factor in equation 2 has a value of 1.0 when the slope is 9%. Soil erosion increases exponentially with the slope. It has been widely accepted that in the tropics the exponential term for the slope is equal to 2 (Hudson, 1981). Thus, the slope factor in the USLE should be substituted by mean slope as follows:

$$S = (s/9)^2 \qquad \ldots\ldots\ldots\ldots\ldots \quad (4)$$

where S = slope factor, and
s = mean percentage slope.

2.2.2 Ranking forests for soil erosion

Substitution of the erosivity, erodibility and slope factor into equation 2 enables the mean annual soil loss to be estimated for a given forest under standard conditions, which are as follows:

(i) slope length is 22.6 m,
(ii) land use is bare cultivated fallow, and
(iii) land is ploughed up and down the slope.

In other words, the value of the mean annual soil loss represents the worst case scenario when the forest is removed and the land is badly managed. These erosion values can be reduced substantially by introducing conservation practices and covering the bare soil with vegetation. Forests with very high soil erosion rates are those most important for soil conservation; they rank high in priority for protection measures.

2.3 HEADWATERS

Policy within the Sri Lanka's Commission on Land Use demands that

(i) stream sources and headwaters of river systems,
(ii) water divides, and
(iii) stream reservations and riparian land

be protected for soil and water conservation purposes.

The importance of a forest for protecting stream sources is evaluated by counting the number of streamlets originating from within a forest using the 1:63,360 topographic series of maps. A second criteria used is the number of major river catchments protected by the forest, based on the standard system of river catchments defined by the Irrigation Department (Navaratne, 1985). Assessing the importance of a forest in terms of its proximity to the headwaters of a river and for protecting stream reservations and riparian land is based on the distance from the forest to the outlet of the river. Distance was selected as the criterion because water originating from a given forest will sustain flora and fauna throughout its course to the sea. It is measured from the headwaters stream closest to the centre of the forest, along its course to the outlet, using the 1:63,360 maps.

In summary, the assessment is based on:

(i) the number of streamlets originating from the forest,
(ii) the number of river catchments protected by the forest, and
(iii) the distance (km) from the headwaters stream nearest to the centre of the forest to the outlet.

2.4 FLOOD HAZARD

In the absence of flow records for a forest, a preliminary estimate of the mean annual flood or other flood statistics may be obtained from the relationship between floods and catchment characteristics using maps (NERC, 1975). However, this indirect method is generally less reliable than any direct analysis of flood statistics. Research in the UK has provided a set of equations relating mean annual flood to catchment area alone, with provision for regional variations. Other investigations have taken into account climate and slope (NERC, 1975).

The use of multiple regression techniques to study the relationship between mean annual flood and its coefficient of variation and catchment characteristics is widely accepted. One reason why such techniques have been so useful in assessing flood hazard is the strong relationship between mean annual flood and other variables, such as slope and channel network (i.e. number of streams per unit area), which can be estimated easily from topographic maps.

2.4.1 Estimating flood hazard from catchment characteristics

In the absence of any previous research on estimating flood hazard from catchment characteristics for Sri Lankan conditions, a model developed in the UK has been adopted for the present study. This is justified because the behaviour of most of the variables concerned with the flooding component of the hydrological cycle appear to be the same. Details of the analysis and the flood prediction equations are given in a Flood Studies Report (NERC, 1975).

In the UK study, catchment characteristics were obtained from 1:63360 and 1:25000 topographic maps. Climatic variables were also used. Of these variables, only those which can be measured or estimated accurately were selected for this study, namely mean annual rainfall, catchment area (or forest area for the purposes of this study) and stream frequency. These three variables account for 86% of the variation of mean annual flood.

Most of the rainfall stations in Sri Lanka have more than 30 years of rainfall data from which mean annual rainfall can be calculated. Area can be measured using a planimeter. Stream frequency is measured by counting the number of channel junctions within a forest, using the 1:63,360 topographic series, and dividing by its area. A stream without any junctions is given a value of one, as if it had a single junction. It is best to work progressively up along each tributary; the running total is noted at each major junction. This value is then divided by the area and presented as stream junctions/km^2 (adapted from NERC, 1975).

Stream frequency was selected in preference to drainage density which cannot be reliably sampled by grid or other methods (NERC, 1975). It is simpler to measure and it is strongly correlated with drainage density (Melton, 1958). Moreover, 1:63,360 maps are sufficiently detailed for measuring stream frequency. In the UK study, there was a very high correlation (0.89) between stream frequency measurements from 1:63,360 and 1:25,000 maps for 55 catchments.

The predictive equation for mean annual flood is given below:

$$BESMAF = 4.53 * 10^{-5}\ AREA^{0.84}\ STMFRQ^{0.51}\ SAAR^{1.34} \qquad \ldots\ldots\ldots\ldots\ (5)$$

where BESMAF = Mean annual flood ($m^3\ s^{-1}$),
AREA = Area (km^2),
STMFRQ = Steam frequency (stream junctions km^{-2}), and
SAAR = Mean annual rainfall (mm)

It should be noted that the values estimated from the equation will not provide absolute values of mean annual flood since the regression equation was derived from a different set of data. However, the values indicate the "flood response" of each forest and should be used for ranking purposes only.

2.5 FOG INTERCEPTION AT HIGHER ALTITUDES

Altitude has been identified as a criteria for identifying forests for conservation in the past mainly because the headwaters of major rivers originate from higher elevations. However, the importance of forests for protecting stream sources and headwaters of river systems is assessed using measures other than altitude, as described in Section 2.3.

Recent research has shown that altitude has a direct effect on the hydrological cycle through the contribution of additional moisture from cloud forests (Juvik *et al.*, 1978, Gunawardena, 1991; Mowjood and Gunawardena 1992). Since a given forest may extend over a range of altitudes, altitude needs to be adjusted accordingly, using a procedure similar to the isohyetal method (Linsley *et al.*, 1982). Calculation of the mean elevation enables the percentage of additional moisture contributed through fog interception to be calculated using the following equation, which was derived from experimental studies conducted in Hawaii:

$$Y = -38.5 + 0.04\ X \qquad \ldots\ldots\ldots\ldots\ (6)$$

where Y = additional percentage moisture contributed by fog, and
X = altitude (m).

Mean annual rainfall for a given forest is multiplied by Y (equation 6) to estimate the annual fog contribution (mm). The equation is valid for forests above 1500 m, there being no significant fog interception at lower altitudes.

Application of this equation, derived from fog studies in Hawaii, to conditions in Sri Lanka is justified elsewhere (Gunawardena, 1991). Similar studies are underway in Sri Lanka which, once completed, will enable the coefficients in equation 6 to be modified.

2.6 EVALUATION

The following evaluation is applied to all natural forests except those which have already been designated for strict protection by the government because they lie in the immediate catchment of hydroelectric and water supply reservoirs.

2.6.1 Preliminary ranking

Forests are ranked according to four main criteria as a measure of their importance in soil conservation and hydrology. The four criteria are:

(i) erosion hazard,
(ii) importance as headwaters of rivers,
(iii) flood hazard, and
(iv) additional moisture contributed by fog interception.

Erosion hazard is measured for each forest as mean annual soil loss (t ha^{-1} yr^{-1}) using equation 1 which treats (a) erosivity, (b) erodibility and (c) slope as independent variables.

The importance of a forest for protecting **headwaters of rivers** is measured in terms of a) the number of streamlets originating from the forest, b) the number of river catchment areas protected by the forest, and c) the length along the river from the centre of the forest to the river outlet. Each forest is ranked in descending order for criteria a, b, and c, separately. The values of the three columns of ranks are added horizontally, and the lowest value is assigned the highest rank. If two values are equal, priority is given in the following order: a), b), c).

Mean annual flood, which is used as an index of **flood hazard**, is estimated for each forest by substituting (a) mean annual rainfall, (b) area and (c) stream frequency in the predictive equation 5.

Fog interception is measured as the additional moisture (mm yr^{1}) contributed by a forest (above 1,500 m).

2.6.2 Final ranking

The four main criteria (Section 2.5.1) are classified into two groups, namely:

(i) soil conservation (criterion i)
(ii) hydrological importance (criteria ii, iii, and iv)

Importance for soil conservation is based on ranking the erosion hazard (criterion i). Hydrological importance is based on ranking the summation of the rank values of criteria ii, iii, and iv. The lowest value is ranked highest. If there are two equal values, priority is given in the following order: criteria ii, iii, iv. Ranks for soil conservation and hydrological importance are added and their values ranked,the lowest value being ranked highest. If two values are equal, priority is given to soil conservation (see Section 1.3). A worked example for selected forests in Matara and Galle districts is given in Annex 1.

2.7 CONSTRAINTS

The methodology developed for this study is adequate for a rapid assessment of the importance of forests for soil conservation and hydrology. Although some field checking is carried out to validate the results, subjectively interpreting them as necessary, more detailed, quantitative studies of soil and hydrological conditions in Sri Lanka are required in order to refine the methodology.

Plans are underway to examine soil erosion and hydrology in the upper catchment areas of the country using a Geographic Information System. Once the relevant data have been digitised, they can be used to verify the findings of the present study.

REFERENCES

Arnoldus, H.M.J. (1980). *An approximation of the rainfall factor in the universal soil loss equation. Assessment of Erosion*. John Wiley & Sons, Chichester. Pp. 127-132.

Bosch, J.M. and Hewlett, J.D. (1982). A review of catchment experiments to determine the effect of vegetation changes on water yield and evaporation. *Journal of Hydrology* 55: 3-23.

Bruijnzeel, P.S. (1986). Environmental impact of deforestation in the humid tropics: a watershed perspective. *Wallaceana* 46: 3-13.

Dickinson, R.E. (1980). Effects of tropical deforestation on climate. In *Browning in the wind: deforestation and long-range implications*. College of William and Mary, Department of Anthropology, Williamsburg, USA. Pp. 411-441.

Fleming, G. (1975). *Computer simulation of hydrology*. Elsevier, New York. Pp. 70-78.

Gunawardena, E.R.N. 1987. Computer simulation of runoff and soil erosion from small agricultural catchments in Sri Lanka. Ph.D. thesis, Silsoe College, UK. Pp. 147-155.

Gunawardena, E.R.N. (1989a). Identification of landuse and physiographic parameters in computer simulation of soil erosion. In *Agricultural engineering: land and water use*, eds Dodd A. and Grace, M. Balkema Publications, Rotterdam. Pp. 757-764.

Gunawardena, E.R.N. (1989b). Hydrological and soil erosion studies on *Pinus* in Sri Lanka. In: *Reforestation with pinus in Sri Lanka*, eds Gunasena,H.P.M., Gunatilleke S. and Perera, A.H. Proceedings of a Symposium organised by University of Peradeniya and the British High Commission on behalf of the Overseas Development Administration, UK, 15-16 July, 1988, Kandy. Pp. 46-55.

Gunawardena, E.R.N. (1991). Priorities in forest hydrology research in the uplands. In *Multipurpose tree species in Sri Lanka: research and development*, ed. Gunasena, H.P.M. Pp. 19-29.

Gunawardena, E.R.N. and Taylor, J.C. (1988). Application of the Stanford watershed and sediment models to small agricultural catchments in Sri Lanka. In *Computer methods and water resources: fluvial hydraulics*. Computational Publications, UK. Pp. 247-259.

Hamilton, L.S. and King, P.N. (1983). *Tropical forested watersheds: hydrological and soils response to major uses or conversions*. Westview Press, Boulder, USA. 155 pp.

Haigh, M.J., Rawat, J.S. and Bisht, H.S. (1988). Hydrological impact of deforestation in the central Himalaya. In *Hydrology of mountain areas*. Pp. 419-433.

Hibbert, A.R. (1967). Forest treatment effects on water yield. *Proceedings of the International Symposium on Forest Hydrology*. Pergamon Press, Oxford. Pp. 527-543.

Hudson, N.W. (1981). *Soil conservation*. Betsford, London. Pp. 33-38, 47-74.

IUCN, (1986). *Managing protected areas in the tropics*. IUCN, Gland, Switzerland. Pp. 46-47.

Joshuwa, W.D. (1977). Soil erosive power of rainfall in the different climatic zones of Sri Lanka. *IASH-AISH Publication No.* 122. Pp. 51-61.

Juvik, J O. and Ekern, P.C. (1978). A climatology of mountain fog on Mauna Loa. Hawaii Island. *Water Resources Research Centre, University of Hawaii, Technical Report No.* 118. 70 pp.

Krishnarajah, P. (1982). Soil erosion and conservation in the upper Mahaweli watershed. Paper presented at the Annual Session of the Soil Science Society of Sri Lanka, 13 November 1982. 15 pp.

Kunkle, S.H. and Dye, A.J. (1981). The effects of forest clearing on soils and sedimentation. In *Tropical agricultural hydrology*, ed. Lal, R. and Russell, E.W. Pp. 99-109.

Lal, R. (1976). Soil erosion on alfisols in western Nigeria. Effects of rainfall characteristics. *Geoderma* 16: 389-401.

Linsley, R.K., Kohler, M.A. and Paulhus, J.L.H. (1982). *Hydrology for engineers*. 3rd Edition. McGraw-Hill, New York. Pp. 71-74.

Meher-Homji, V.M. (1980). The link between rainfall and forest clearance: case studies from western Karnataka. *Transactions of the Institute of Indian Geographers* 2: 59-65.

Meher-Homji, V.M. (1988). Effects of forests on precipitation in India. In *Forests, climate and hydrology*, eds Reynolds E.R.C. and Thompson F.B. The United Nations University, Tokyo, Japan. Pp. 51-77.

Melton, M.A. (1958). Correlation structure of morphomeric properties of drainage systems and their controlling agents. *Journal of Geology* 66: 442-460.

Morgan, R.P.C. (1980). *Soil erosion*. Longman, UK. 113 pp.

Morgan, R.P.C., Morgan, D.D.V. and Finney, H.F. (1982). Stability of agricultural eco-systems: documentation of a simple model for soil erosion. Soil erosion assessment. *IIASA Collaborative Paper* CP-82-59.

Mowjood, M.I.M. and Gunawardena, E.R.N. (1992). Designing and testing of a rotating screen fog collector. *Agricultural Engineering* 4(1). In press.

Navaratne, N.M.G. (1985). Hydrometric network. In *Some aspects of water resources of Sri Lanka with special reference to hydrology*. The National Committee of Sri lanka for the International Hydrological Programme. Irrigation Department, Colombo, Sri Lanka. pp 1-12.

NEDECO (1984). *Sediment transport in the Mahawell Ganga*. Irrigation Department, Colombo. 74 pp.

NERC (1975). *Flood studies report*. Vol. 1. *Hydrological studies*. Whitefrias Press, London. 550 pp.

Oyabande, L. (1988). Effects of tropical forests on water yield. In *Forests, climate and hydrology*, Eds Reynolds, E.R.C. and Thompson, F.B. The United Nations University, Tokyo, Japan. Pp. 16-49.

Pereira, H.C. (1989). The role of forests in watershed management. In *Policy and practice in the management of tropical watersheds*, ed. Pereira, H.C. Westview Press. Pp. 57-77.

Perera, M.B.A. (1989). Planned landuse for the tea country. *Sri lanka Journal of Tea Science* 58(2): 92-103.

Ponnadurai, D.K., Gomez, G.E.M. and Kandiah, A. (1977). Effect of selective felling on the hydrological parameters of a wet zone catchment. Paper presented at the Asian Regional Meeting of the International Hydrological Programme National Committee of Unesco and WHO Regional Meeting of Working Group on Hydrology, Colombo, Sri Lanka. 10 pp.

Premalal, W.P.R. (1986). Development of an erosivity map for Sri Lanka. A research report submitted for the requirement of the B.Sc. degree. Department of Agricultural Engineering, University of Peradeniya, Sri Lanka. 65 pp.

Stocking, M.A. (1984). Land use planning - Phase II, Sri Lanka. UNDP/FAO AGOF: SRL/84/032. Report submitted to Ministry of Lands and Land Development, Colombo. 55 pp.

Tejwani, K.G. (1977). Trees reduce floods. *Indian Farming* 26(11): 57.

Unesco (1978). *Tropical forest ecosystems.* Unesco/UNEP/FAO, Paris.

Wiersum, K.F. (1984). Surface erosion under various tropical agroforestry systems. In *Proceedings of the Symposium on Effect of Forest Landuse on Erosion and Slope Stability*, eds. O'Loughlin, C.L. and Pearce, A.J. Pp. 231-239.

Wischmeir, W.H. and Smith, D. (1958). A rainfall erosion index for a universal soil equation. *Journal of the Soil Science Society of America* 23: 246-249.

Wischmeir, W.H. and Smith, D. (1965). Predicting rainfall erosion losses from croplands east of Rocky Mountains. *US Department of Agriculture, Agricultural Handbook* 282. 47 pp.

RANKING FORESTS FOR SOIL CONSERVATION AND HYDROLOGY

This annex provides a worked example for nine forests selected from Galle and Matara districts. It is based on preliminary data obtained as part of the National Conservation Review.

1. EROSION HAZARD

(a) Estimating rainfall erosivity

Rainfall erosivity is estimated from the following equation:

$$E = 972.75 + 9.95\ MAR, \quad (R^2 = 0.75) \qquad \text{.............. (1)}$$

where E = Erosivity ($J\ m^{-2}\ Yr^{-1}$), and
MAR = Mean annual rainfall (mm).

The isohyetal method is used to estimate mean annual rainfall. This is illustrated in Figure 1 for Dellawa using mean annual rainfall data from nearby rain gauge stations (Table 1). Data for each station are plotted on a

Table 1 Data from rain gauge stations in the vicinity of Dellawa

Rain gauge station	Mean annual Rainfall (mm)	Location	
		Latitude	Longitude
1. Panilkanda Estate	3208	06-21-33N	80-37-38E
2. Tawalama	4731	06-20-28N	80-21-22E
3. Millawa Estate	3749	06-17-35N	80-27-41E
4. Morawaka	3386	06-15-25N	80-29-25E
5. Opatha	4080	06-16-05N	80-24-29E
6. Vedagala	3564	06-27-15N	80-25-32E
7. Dependene Group	3483	06-27-45N	80-32-56E
8. Lauderdale Group	3478	06-25-08N	80-36-23E

1:63,360 map, enabling contours of equal rainfall (isohyets) to be drawn. Mean annual rainfall is estimated for each area between adjacent isohyets, weighted by its percentage area. Summation of the mean values for each area provides an estimate of mean annual area for the entire forest, as follows:

$$MAR = \frac{A\ (R_A + R_B)/2 + B\ (R_B + R_C)/2 + C\ (R_C + R_D\ ) + \ldots}{100} \qquad \text{.... (2)}$$

where MAR = Mean annual rainfall,
R_A, R_B, R_C, and R_D are the rainfall isohyets, and
A, B, and C are the % areas enclosed within isohyets R_A - R_B, R_B - R_C, and R_C - R_D, respectively.

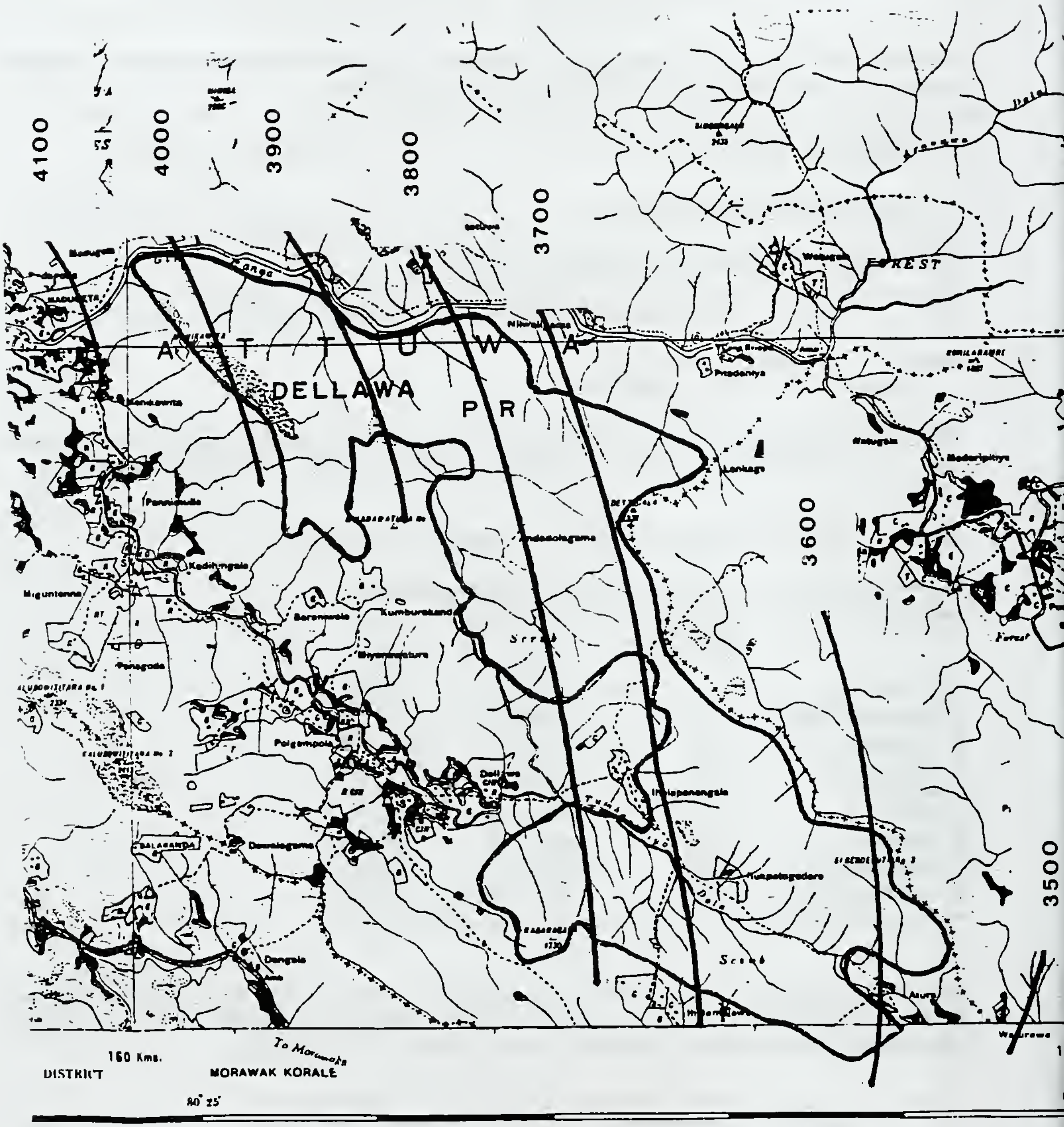


Figure 1 Mean annual rainfall isohyets for Dellawa

Substituting the values from Figure 1, the mean annual rainfall for Dellawa is calculated as follows:

$$MAR = \frac{3.1(4050) + 14.2(3950) + 20.8(3850) + 23.5(3750) + 34.8(3650) + 3.4(3550)}{100}$$

$$= 3759 \text{ mm}$$

The value for mean annual rainfall is substituted in equation 1 in order to calculate an erosivity value for Dellawa as follows:

$$E = 972.75 + (9.95 \times 3759)$$
$$= 38375 \text{ J m}^{-2} \text{ yr}^{-1}$$

The erosivity index (383.75) is obtained by dividing the erosivity value by 100. It indicates the ability of the rainfall to cause soil erosion. Mean annual rainfall and the respective erosivity values are given in Table 2 for each forest.

Table 2 Mean annual rainfall and erosivity index for selected forests in Galle and Matara districts

Forest	Mean annual rainfall (mm)	Erosivity index
1. Beraliya (Akuressa)	2671	275.49
2. Dellawa	3759	383.75
3. Diyadawa	3410	349.02
4. Kalubowitiyana	4189	426.53
5. Kanumuldeniya	2432	251.71
6. Kekanadura	1721	180.97
7. Masmullakele	2076	216.29
8. Oliyagankele	2465	254.99
9. Rammalekanda	2837	292.01

(b) Estimating soil erodibility

The major soil type(s) within a forest can be determined by superimposing the forest boundary onto the soil map (published by the Survey Department of Sri Lanka). Erodibility values of the major soil types are given by Joshuwa (1977). If there is more than one type within a forest, the erodibility value should be weighted according to the area covered by the different soils.

All forests selected in this example have red yellow podzolic soils, for which the erodibility value is 0.22.

(c) Determining slope factor

Forest boundaries are marked onto 1:63,360 maps and a 10 mm x 10 mm grid drawn over each forest, as shown in Figure 2 for Dellawa. The perpendicular distance is measured from the contour at each grid point to the nearest stream. This distance is divided by the altitudinal difference between the contours at the grid point and the stream in order to calculate the slope. Slope values are summed and divided by the number of grids in order to obtain a mean value.

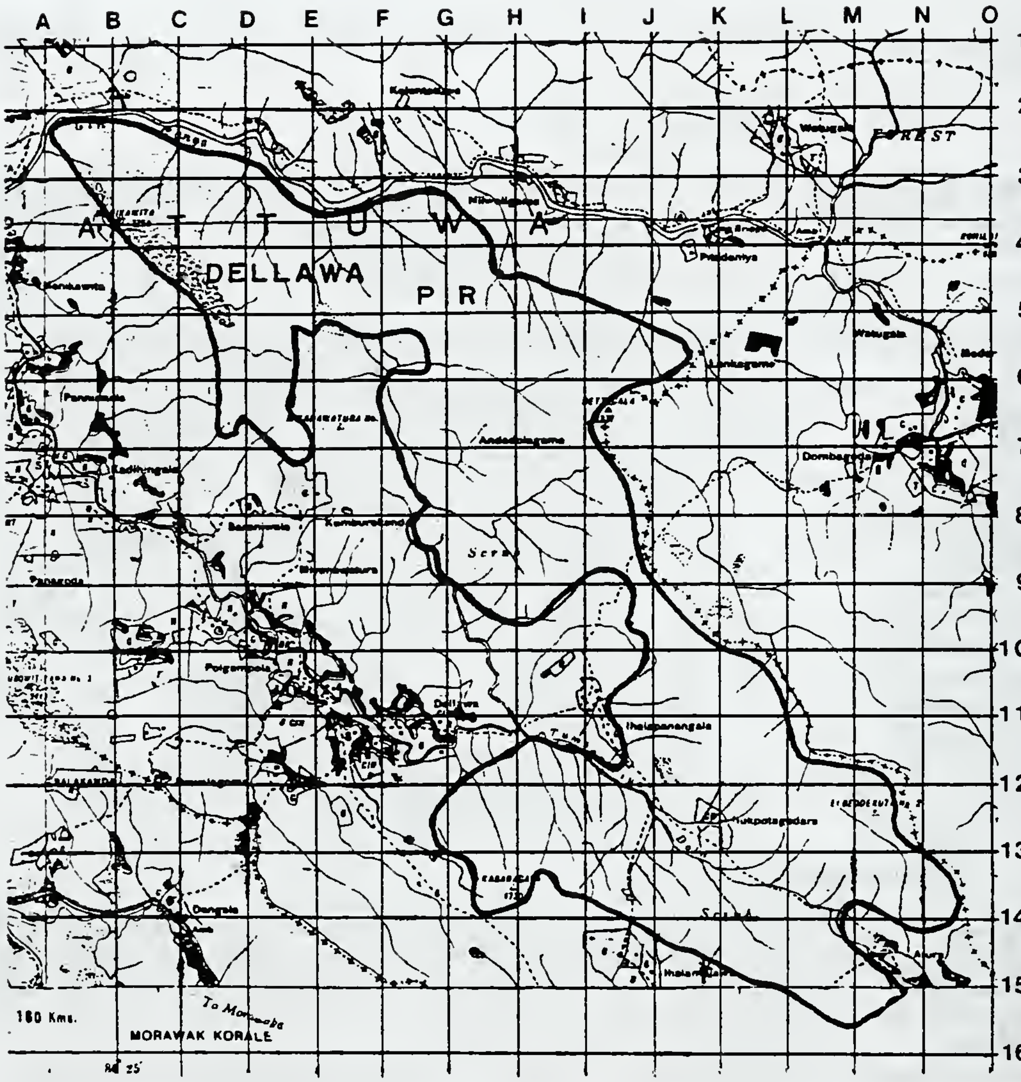


Figure 2 Overlaying a 10x10 mm grid onto a contour map to estimate mean slope in Dellawa

Table 3 Slopes at grid points in Dellawa

	B	C	D	E	F	G	H	I	J	K	L	M	N
3	0.38	0.41	0.47	-	-	-	-	-	-	-	-	-	-
4	-	0.12	0.34	0.47	0.47	0.37	-	-	-	-	-	-	-
5	-	-	0.39	0.0	0.32	0.3	0.47	0.3	-	-	-	-	-
6	-	-	0.34	-	-	0.24	0.12	0.41	0.47	-	-	-	-
7	-	-	-	-	-	0.24	0.0	0.32	-	-	-	-	-
8	-	-	-	-	-	0.30	0.24	0.36	-	-	-	-	-
9	-	-	-	-	-	-	0.47	-	0.0	-	-	-	-
10	-	-	-	-	-	-	-	-	0.0	0.28	-	-	-
11	-	-	-	-	-	-	-	-	0.47	0.36	0.24	-	-
12	-	-	-	-	-	-	0.32	0.09	0.63	0.0	0.47	0.0	-
13	-	-	-	-	-	0.39	0.47	0.12	0.16	0.47	0.59	0.42	0.32
14	-	-	-	-	-	-	-	-	0.06	0.32	0.24	-	0.0
15	-	-	-	-	-	-	-	-	-	-	0.09	0.24	-

The slope at each grid point is given in Table 3 for Dellawa. Summation of the slopes (14.38) and division by the total number of grid points (52) gives a mean value of 0.28, or 28%. The slope factor is calculated as follows:

$$S = (s/9)^2$$
$$= (28/9)^2$$
$$= 9.68$$

where S = slope factor, and
s = mean percentage slope.

Mean slope and the slope factor are given for each forest in Table 4.

Table 4 Mean slope and slope factor for selected forests in Galle and Matara districts

Forest	Mean slope (%)	Slope factor
1. Beraliya (Akuressa)	20	4.94
2. Dellawa	28	9.68
3. Diyadawa	33	13.44
4. Kalubowitiyana	48	28.44
5. Kanumuldeniya	14	2.42
6. Kekanadura	3	0.11
7. Masmullakele	12	1.78
8. Oliyagankele	14	2.42
9. Rammalekanda	23	6.53

(d) Calculating soil erosion

The erosion hazard, or mean annual soil loss, is calculated by substitution of the values of the (a) erosivity index, (b) erodibility, and (c) slope factor into equation 4.

$$A = E.K.S. \qquad \qquad (4)$$

where A = mean annual soil loss (t ha^{-1} yr^{-1}),
E = erosivity index,
K = erodibility, and
S = slope factor.

Substituting the respective values for Dellawa forest,

$$A = 383.75 \times 0.22 \times 9.68$$
$$= 817.23 \text{ t ha}^{-1} \text{ yr}^{-1}$$

Values of the erosivity index, erodibility, slope factor and erosion hazard are given in Table 5 for each forest. These results show that Kalubowitiyana has the highest erosion hazard. This forest has the highest erosivity index as well as the highest slope factor, making it most prone to erosion.

Table 5 Erosion hazard for selected forests in Galle and Matara districts, together with values of erosivity index, erodibility and slope factor

Forest	Erosivity index	Erodibility	Slope factor	Erosion hazard t $ha^{-1}yr^{-1}$
1. Beraliya (Akuressa)	275.49	0.22	4.94	299.3
2. Dellawa	383.75	0.22	9.68	817.2
3. Diyadawa	349.02	0.22	13.44	1032.3
4. Kalubowitiyana	426.52	0.22	28.44	2669.1
5. Kanumuldeniya	251.71	0.22	2.42	134.0
6. Kekanadura	180.97	0.22	0.11	4.4
7. Masmullakele	216.29	0.22	1.78	84.6
8. Oliyagankele	254.99	0.22	2.42	135.8
9. Rammalekanda	292.01	0.22	6.53	419.6

2. HEADWATERS

(a) Streamlets originating from a forest

The number of streamlets originating from a forest is counted, using the 1:63,360 series of maps.

The value for Dellawa is 77.

(b) Number of river catchments protected by a forest

Streamlets originating from a forest are traced to major rivers, identified as such by the Irrigation Department (see Section 2.3). The number of major rivers into which flow the streamlets of a forest is counted.

Dellawa contributes water to two major rivers, namely Nilwala and Gin Ganga.

(c) Distance from headwaters of centralmost stream to its outlet

The stream closest to the centre of a forest is selected and the distance measured from its headwaters to its mouth, using a thread laid along its course. If there are two river catchments, the values of the respective distances are summed.

Values for Dellawa are as follows:

Distance along Nilwala River	= 58
Distance along Ginganga	= 87
Total distance	= 145 km

The number of streamlets and river catchments, and the total distance between headwaters and outlets are given in Table 6 for each forest.

Table 6 Distance of stream headwaters from river mouths for selected forests in Galle and Matara districts, together with the number of streamlets and major rivers

Forest	Streams	Major	Headwaters distance (km)*				
		rivers	Nil	Gin	Pol	Kir	Total
1. Beraliya (Akuressa)	37	2	37	-	27	-	64
2. Dellawa	77	2	58	87	-	-	145
3. Diyadawa	73	2	64	95	-	-	158
4. Kalubowitiyana	5	2	61	79	-	-	140
5. Kanumuldeniya	5	1	-	-	-	30	30
6. Kekanadura	0	-	-	-	-	-	-
7. Masmullakele	1	1	17	-	-	-	17
8. Oliyagankele	0	-	-	-	-	-	-
9. Rammalekanda	43	2	64	-	-	39	103

*Nil = Nilwala; Gin = Ginganga; Pol = Polwatta Ganga; Kir = Kirama Oya

3. FLOOD HAZARD

Mean annual flood for a given forest is used as an index of its response to floods, and hence provides a measure of its role in reducing flood hazard. It is estimated using the following predictive equation:

$$BESMAF = 4.53*10^{-5}\ AREA^{0.84}\ STMFRQ^{0.51}\ SAAR^{1.34} \quad (5)$$

where BESMAF = Mean annual flood ($m^3\ s^{-1}$),
AREA = Area (km^2),
STMFRQ = Steam frequency (stream junctions km^{-2}), and
SAAR = Mean annual rainfall (mm)

(a) Area

This information is available for most forests that have been notified as forest reserves under the Forest Ordinance or as national reserves and sanctuaries under the Fauna and Flora Protection Ordinance. It is also available for proposed reserves. For other state forests, for which such information may not be available, the area is measured directly from 1:63,360 maps using a planimeter.

The area of Dellawa is 22.36 km^2.

(b) Stream frequency

Using 1:63360 maps on which forest boundaries have been marked, the number of stream junctions within each boundary is counted. Streams without any tributaries are considered as one junction.

The total number of stream junctions within the 22.36 km^2 Dellawa is 65. Thus, its stream frequency is:

$$STRFRQ = 65/22.36$$
$$= 2.9$$

(c) Mean annual rainfall

Determination of mean annual rainfall is described in Section 1(a).

The mean annual rainfall (SAAR) for Dellawa is 3759 mm.

(d) Calculating flood hazard

Substituting values of a), b) and c) into equation 5, the mean annual flood for Dellawa is:

$$BESMAF = 4.53*10^{5}\ 22.37^{0.84}\ 2.9^{0.51}\ 3759^{1.34}$$
$$= 65.47\ (m^3\ s^{-1})$$

If a forest does not have a stream originating from it, the mean annual flood is considered to be equal to zero. The Values of area, stream frequency, mean annual rainfall and mean annual flood are given in Table 7.

Table 7 Flood hazard for selected forests in Galle and Matara districts, together with values of area, stream frequency and mean annual rainfall

Forest	Area km^2	Stream freq. km^{-2}	Mean annual rainfall mm	Flood hazard $t\ ha^{-1}yr^{-1}$
1. Beraliya (Akuressa)	16.46	1.80	2671	25.11
2. Dellawa	22.36	2.90	3759	65.47
3. Diyadawa	24.48	2.52	3410	57.72
4. Kalubowitiyana	2.72	1.84	4189	10.23
5. Kanumuldeniya	6.79	0.64	2432	6.21
6. Kekanadura	3.80	0.00	1721	0.00
7. Masmullakele	6.18	0.14	2076	2.14
8. Oliyagankele	4.86	0.00	2465	0.00
9. Rammalekanda	14.07	2.22	2837	26.55

4. FOG INTERCEPTION

Assessment of fog interception applies only to forests above 1500 m. All forests selected from Matara and Galle districts for purposes of this worked example lie below this altitude. Hence, the additional moisture contributed by fog interception is zero.

For illustrative purposes, the procedure for estimating fog interception for a selected forest, Hakgala, is given below using equation 6.

$$Y = -38.5 + 0.04\ X \qquad \text{.............. (6)}$$

where Y = additional percentage moisture contributed by fog, and
X = altitude (m).

The mean altitude of Hakgala is 1,980 m, and its mean annual rainfall is 1701 mm. Thus,

$$Y = -38.5 + (0.4 \times 1980)$$
$$Y = 41\%$$

and Annual fog contribution = 1701 x 41/100
= 697 mm.

5. EVALUATION

Preliminary ranking

Forests are ranked according to a single criterion, erosion hazard, as a measure of their importance for soil conservation, and according to three criteria for assessing their hydrological value, namely importance as headwaters of rivers, flood hazard and additional moisture contributed by fog interception.

The importance of a forest for protecting headwaters of rivers is assessed in terms of three sub-criteria: the number of streamlets originating from it, the number of river catchments protected by it, and the distance from the headwaters to the river mouth. Each of these sub-criteria is ranked separately and the values of the three columns of ranks are added horizontally to derive an overall headwaters value which is then ranked. If values are equal, priority is given in the order: streams, major rivers and distance. The results of this ranking procedure are given in Table 8.

Table 8 Selected forests in Matara and Galle districts ranked for their importance as headwaters catchments

Forest	Streams rank	Major rivers rank	Distance rank	Headwaters total	Headwaters rank
1. Beraliya (Akuressa)	4	1	5	10	5
2. Dellawa	1	1	2	4	1
3. Diyadawa	2	1	1	4	2
4. Kalubowitiyana	5	1	3	9	4
5. Kanumuldeniya	5	2	6	13	6
6. Kekanadura	7	3	8	18	8
7. Masmullakele	6	2	7	15	7
8. Oliyagankele	7	3	8	18	8
9. Rammalekanda	3	1	4	8	3

Hydrological importance is determined by adding the rank values of headwaters importance, flood hazard and fog interception and assigning the highest rank for the lowest total. If two or more values of the total are equal, priority is given to the value of the headwaters rank. The results of this ranking procedure are given in Table 9.

Table 9 Selected forests in Matara and Galle districts ranked for their hydrological importance

Forest	Headwaters rank	Flood hazard rank	Fog interception	Hydrology total	Hydrology rank
1. Beraliya (Akuressa)	5	4	-	9	4
2. Dellawa	1	1	-	2	1
3. Diyadawa	2	2	-	4	2
4. Kalubowitiyana	4	5	-	9	5
5. Kanumuldeniya	6	6	-	12	6
6. Kekanadura	8	8	-	16	8
7. Masmullakele	7	7	-	14	7
8. Oliyagankele	8	8	-	16	8
9. Rammalekanda	3	3	-	6	3

Final ranking

The rank values of erosion hazard and hydrology are summed for each forest and the total ranked to obtain an overall ranking for soil conservation and hydrology. If two or more totals are equal, priority is given to erosion hazard. The results of the final ranking are given in Table 10.

Table 10 Final ranking of selected forests in Galle and Matara districts for their importance in soil conservation and hydrology

Forest	Erosion hazard	Hydrology	Erosion hazard + hydrology	
	rank	rank	total	rank
1. Beraliya (Akuressa)	5	4	9	5
2. Dellawa	3	1	4	2
3. Diyadawa	2	2	4	1
4. Kalubowitiyana	1	5	6	3
5. Kanumuldeniya	7	6	13	6
6. Kekanadura	9	8	17	9
7. Masmullakele	8	7	15	8
8. Oliyagankele	6	8	14	7
9. Rammalekanda	4	3	7	4

This worked example shows that Diyadawa is overall the most important of the selected forests for its role in conserving soil and maintaining the hydrological regime. Dellawa is hydrologically the most important forest, mainly due to its dense stream network. Kalubowitiyana ranks highest for soil conservation alone, a reflection of its high rainfall and steep terrain, but it is relatively less important for hydrology due to its small size. The extremely high erosion hazard, more than double that of any other forest (Table 5), might appear to be exaggerated but checking in the field showed that erosion is high, as evidenced by a recent landslide.

PART C

THE CONSERVATION VALUE OF NATURAL FORESTS IN SOUTHERN PROVINCE: A PRELIMINARY REPORT

1. INTRODUCTION

The National Conservation Review (NCR) component of the Environmental Management in Forestry Developments Project addresses the biological importance of natural forests, together with their value for soil conservation and hydrology. Included are all natural forests within politically accessible parts of the country (i.e. excluding Northern and Eastern provinces). The NCR follows on from an earlier Accelerated Conservation Review (ACR) of 30 lowland rain forests, managed as 13 units and covering some 480 km^2 (TEAMS, 1991). Scientific information on their conservation importance was urgently needed because these forests had been earmarked for logging. Thus, the review was necessarily rapid, with fieldwork conducted on an opportunistic basis over a three month period. Some 359 km^2 have since been allocated for conservation management by the Forest Department (see Part A, Section 1.6.2).

Implicit in the Project Document (UNDP/FAO, 1989) is the requirement that the ACR be extended to **remaining natural forest not covered by the ACR**, which is based on the assumption that the methods used for the ACR would be applied to the NCR. The methods used for the ACR were reviewed but considered to be inadequate for purposes of the NCR, given the need to be able to prioritorise forests for conservation. The ACR is constrained by the lack of any systematic approach to sampling biological diversity and by biases in sampling intensity. The hydrological component of the ACR focuses mainly on soil erosion and its impact on irrigation, hydropower and water supply schemes resulting from sedimentation. The importance of forests in also controlling floods, protecting headwaters of river systems and providing additional moisture to the hydrological regime through the interception of fog is not taken into account. Unfortunately, the ACR methods cannot be fully evaluated with respect to the NCR because they are not sufficiently well documented.

In view of the different procedures developed for the NCR, it was considered essential to resurvey those forest previously covered by the ACR in order to be able to compare sites for their conservation importance. This decision is proving to be amply justified (see Section 2.6).

The NCR commenced in April 1991. Initial months were spent putting together a team and developing sampling techniques. Fieldwork commenced in September 1991, with priority given to the wet zone as conditions in the field permitted. Work on the soil conservation and hydrology component of the NCR began late in 1992 but has since caught up with the biological diversity studies.

The entire Southern Province, comprising Galle and Matara districts in the wet zone and Hambantota in the dry zone, was surveyed by the end of 1992. This represents approximately 10% of the country. The results of this survey are presented in this preliminary report. Findings are tentative because the importance of forests within Southern Province cannot be evaluated within a national context until the NCR is completed. Despite this limitation, those forests which have been surveyed can be compared with each other in order to assess their relative importance and to identify an optimal conservation areas network for the Province.

1.1 PHYSIO-CLIMATIC CHARACTERISTICS OF SOUTHERN PROVINCE

Galle, Matara and Hambantota districts lie within the wet, wet and intermediate, and dry zones, respectively. The wet zone receives a mean annual rainfall of 2000-5000 mm, with substantial rain falling during both the south-west and north-east monsoons. In the dry zone, which receives 1000-2000 mm annually, rain falls principally during the north-east monsoon. The mean annual rainfall in the intermediate zone[1] is 1300-3500 mm. Considerable variation in the magnitude and timing of the monsoons can result in persistent wet and dry periods which may extend over several years. In the dry zone, months of zero rainfall are very common.

The availability of water has a major influence on the nature of the vegetation. The vegetation is most luxuriant in the wet zone, which supports rain and montane forests. By contrast the intermediate and dry zones tend to

[1]For purposes of this study, the intermediate zone is not distinguished. Galle and Matara are considered to be in the wet zone and Hambantota in the dry zone.

support jungle or scrub vegetation as a result of the high water deficit. Water deficits of up to 500 mm may be experienced from July to December and in February in the intermediate zone, and up to 800 mm from February to September in the dry zone.

In Galle and Matara districts, the terrain consists of steeper hills towards the north and low hills and undulating plains close to the coast. The main rivers are the Gin and Nilwala which originate from within Galle and Matara, respectively, and drain southwards. Discharge is sustained throughout the year, with peak flows during the south-west monsoon.

Hambantota lies almost entirely in the dry zone except for the extreme north-western corner, which comprises 5% of the district. Its highest hills lie along the western boundary.

1.2 METHODS

1.2.1 Biological diversity

Surveys were conducted between September 1991 and December 1992 using the procedures described in Part A (Section 3) of this document to identify and sample natural forests. A total of 52 forests (including three mangroves) of 50 ha[2] and above were surveyed for biological diversity in and adjacent to Southern Province (Table 1). Sinharaja and Ruhuna, in the wet and dry zones, respectively, lie mostly outside the Province but they are included in the analysis because they are large and diverse, providing useful standards against which other forests can be evaluated.

Of the 52 forests, only 16 are considered to have been adequately surveyed (Table 1), based on a 5% threshold for the number of new woody species recorded in the penultimate and last plots, expressed as a percentage of the total number of species (see Part A, Section 3.6.2). In order to accommodate this constraint, forests in close proximity to each other and lying within the same catchment were treated as a single forest complex. The data were combined accordingly for a total of 18 forest complexes, each meeting the 5% criterion for the last two plots. Beraliya (Akuressa) was treated singly, being adequately sampled and somewhat isolated from other forests.

The analysis is based on a total of 21,841 records of 657 species of woody plants and 6,211 records of 365 species of selected groups of animals (Table 2). Over 1,300 plant specimens were collected from the field, most of which have since been identified. Not included in the present analysis are 105 unidentified plant records (representing 13 genera and 27 species) and 573 unidentified animal records (representing 29 species). The large number of unidentified animal records is due to the many records of reptiles and molluscs of known genus awaiting species determination, and to the many records of mammal genera based on indirect observations (tracks, droppings, feeding signs *etc.*). In most cases of the latter, species determination is not possible.

Given that faunal diversity is subject to biased sampling and likely to be grossly underestimated due to the rapidity with which it is necessary to survey forests because of overall time constraints (see Part A, Section 3.6.1), the analysis is based primarily on the data for woody plants and supplemented with those for animals. It can be assumed, however, that plant and animal diversity are closely correlated. As demonstrated in Figure 1, forests rich in woody species are rich in animal species and *vice versa*. Figure 1 also shows that woody plant diversity is much higher in the wet zone than in the dry zone, most wet zone forests having a higher diversity than all but the largest of the dry zone forests (i.e. Ruhuna). This does not appear to be the case for faunal diversity, there being no marked difference between wet and dry zone forests. But it could be an artifact, perhaps due to animals being more easily observed in forests in the dry zone as compared to the wet zone.

The analysis has two main objectives. The first is to assess the diversity of each forest (or forest complex) in terms of species richness. This is done by totalling the number of species of woody plants and animals within each site. The second objective is to identify a minimum conservation areas network in which each species is

---

[2]This threshold was raised to 100 ha subsequent to the survey of Southern Province in order to expedite the NCR.

Table 1 List of natural forests surveyed for biological diversity in Southern Province, together with the number of transects, plots and days devoted to each. Original estimates are given in brackets. Forests in bold are considered to have been adequately surveyed (i.e. number of new woody plant species recorded in penultimate or last plot < = 5% total number of species); the rest have been insufficiently sampled.

FOREST No.	Name	Designation	Nat. area (ha)	Present area⁺ (ha)	Transects (no.)		Plots (no.)		Fieldwork (days)		New species Pen. (%)	Last (%)
	WET ZONE DISTRICTS											
	GALLE (N=19)											
509	Auwegalakanda	OSF	250.0	250.0	1	(2)	4	(8)	1	(1)	10.9	3.7
511	Bambarawana	OSF	248.0	248.0	1	(1)	4	(8)	1	(1)	17.6	7.7
37	**Beraliya (Akuressa)***	**PR**	**1859.9**	**1645.5**	**2**	**(3)**	**20**	**(24)**	**4**	**(3)**	**2.1**	**1.5**
38	**Beraliya (Kudagala)**	**PR**	**4241.1**	**2571.8**	**1**	**(1)**	**8**	**(16)**	**2**	**(2)**	**3.0**	**2.4**
62	Darakulkanda	PR	457.6	141.7	1	(3)	6	(8)	1	(1)	16.9	4.6
65	**Dediyagala***	**FR**	**3789.9**	**3789.9**	**1**	**(1)**	**17**	**(24)**	**5**	**(3)**	**0.0**	**0.0**
69	**Dellawa***	**PR**	**2034.0**	**2236.3**	**3**	**(3)**	**15**	**(40)**	**4**	**(5)**	**3.5**	**2.4**
120	Habarakada	PR	209.6	209.6	1	(0)	4	(0)	1	(0)	13.3	11.1
508	Hindeinattu	OSF	200.0	200.0	1	(2)	4	(8)	1	(1)	20.8	7.4
507	Homadola	OSF	300.0	300.0	1	(0)	5	(0)	1	(0)	6.8	5.8
173	Kandawattegoda	PR	404.7	358.6	1	(1)	5	(8)	1	(1)	6.5	11.6
175	**Kanneliya**	**FR**	**6114.4**	**6024.5**	**1**	**(2)**	**24**	**(32)**	**7**	**(4)**	**1.3**	**0.4**
208	**Kombala-Kottawa**	**PR**	**2289.7**	**1624.6**	**2**	**(2)**	**14**	**(16)**	**4**	**(2)**	**0.0**	**1.6**
253	Malambure	FR	1012.3	929.8	1	(2)	7	(16)	2	(2)	8.5	1.2
303	**Nakiyadeniya**	**PR**	**2292.1**	**2235.5**	**2**	**(2)**	**12**	**(16)**	**3**	**(2)**	**2.1**	**0.8**
369	**Polgahakanda**	**FR**	**862.3**	**577.4**	**1**	**(0)**	**8**	**(0)**	**2**	**(0)**	**1.2**	**0.0**
414	**Sinharaja***	**NHWA**	**11187.0**	**11187.0**	**8**	**(4)**	**48**	**(42)**	**7**	**(10)**	**0.5**	**0.5**
505	Tawalama	OSF	1000.0	1000.0	1	(0)	5	(0)	1	(0)	8.0	8.0
506	Tiboruwakota	OSF	600.0	600.0	1	(1)	7	(8)	2	(1)	2.9	5.5
	MATARA (N=19)											
501	Aninkanda	OSF	75.0	75.0	1	(0)	5	(0)	1	(0)	14.4	9.0
24	Badullakele	FR	182.3	147.7	1	(1)	5	(4)	1	(1)	3.8	8.1
60	Dandeniya-Aparekka	FR	560.0	348.3	1	(1)	5	(12)	1	(2)	2.2	7.2
500	Derangala	OSF	50.0	50.0	1	(1)	4	(4)	1	(1)	12.9	4.1
77	**Diyadawa**	**FR**	**2578.2**	**2447.7**	**2**	**(3)**	**17**	**(28)**	**4**	**(3)**	**2.0**	**1.5**
138	Horagala-Paragala	OSF	1800.0	1800.0	1	(1)	4	(24)	1	(3)	12.5	8.9
497	Kalubowitiyana	OSF	100.0	100.0	1	(1)	5	(4)	1	(1)	14.5	3.8
178	Kanumuldeniya*	FR	678.7	678.7	1	(1)	5	(8)	1	(1)	2.5	10.1
190	Kekanadura	FR	401.7	379.9	1	(1)	5	(8)	1	(1)	8.9	3.7
201	Kirinda Mahayayakele	FR	374.1	252.7	1	(1)	6	(8)	1	(1)	11.5	3.3
498	Kurulugala	OSF	175.0	175.0	1	(1)	4	(8)	1	(1)	12.5	5.9
263	Masmullekele	FR	805.4	618.0	1	(1)	6	(16)	1	(2)	7.4	7.7
293	**Mulatiyana**	**FR**	**3277.5**	**3148.9**	**4**	**(4)**	**29**	**(40)**	**7**	**(4)**	**0.5**	**1.9**
329	Oliyagankele	FR	488.6	486.0	1	(1)	6	(8)	1	(1)	8.1	8.3
343	Panilkanda	FR	588.1	588.1	1	(3)	5	(20)	1	(2)	6.9	7.3
388	**Rammalakanda***	**FR**	**1698.1**	**1406.7**	**2**	**(3)**	**16**	**(16)**	**4**	**(2)**	**1.0**	**3.4**
499	Silverkanda	OSF	1000.0	1000.0	1	(2)	5	(16)	1	(2)	8.8	2.6
453	Viharekele	FR	825.1	625.1	1	(1)	6	(12)	1	(2)	7.8	7.3
471	Welihena	FR	333.1	296.8	1	(1)	6	(12)	1	(2)	8.7	4.6
	ADJOINING DISTRICTS (N=1)											
129	Haycock	FR	362.0	362.0	1	(0)	6	(0)	2	(0)	10.3	3.8
	TOTALS (WET ZONE)		55,705.5	51,116.8	56	(58)	367	(522)	83	(71)		

DRY ZONE DISTRICTS

HAMBANTOTA (N=9)

44	Bundala	S	6216.0	6216.0	1	(1)	5	(6)	1	(1)	13.9	2.7
523	**Kahanda Kalapuwa'**	**OSF**	**200.0**	**200.0**	**1**	**(0)**	**3**	**(0)**	**½**	**(1)**	**0.0**	**0.0**
164	Kalametiya Kalapuwa'	S	712.0	712.0	1	(0)	5	(0)	1	(1)	80.0	16.7
186	Katagamuwa	S	1003.6	1003.6	1	(1)	6	(6)	1	(1)	2.4	12.5
237	Madunagala	FR	975.2	975.2	1	(1)	3	(6)	1	(1)	20.8	17.2
525	Miyandagala	OSF	300.0	300.0	1	(1)	2	(6)	1	(1)	100	21.6
524	Rekawa Kalapuwa'	OSF	50.0	50.0	1	(0)	3	(0)	½	(1)	20.0	0.0
398	**Ruhuna Block 1**	**NP**	**13679.2**	**13679.2**	**2**	**(-)**	**24**	**(-)**	**5**	**(-)**	**1.4**	**4.1**
464	Wedasitikanda*	FR	1343.4	1343.4	1	(2)	5	(12)	1	(2)	0.0	14.6

ADJOINING DISTRICTS (N=4)

187	Kataragama	S	837.7	837.7	1	(-)	5	(-)	1	(-)	4.5	8.3
399	**Ruhuna Block 2**	**NP**	**9931.0**	**9931.0**	**2**	**(-)**	**13**	**(-)**	**2**	**(-)**	**3.5**	**5.0**
400	**Ruhuna Block 3**	**NP**	**40775.4**	**40775.4**	**4**	**(-)**	**28**	**(-)**	**6**	**(-)**	**2.9**	**0.9**
401	Ruhuna Block 4	NP	26417.7	26417.7	1	(1)	5	(12)	2	(2)	7.1	16.0
	TOTALS (DRY ZONE)		102,441.2	102,149.8	18	(7)	107	(48)	23	(11)		

*Accounts for lands released subsequent to notification.
*Lies in one or more adjacent districts.
'Mangrove

Table 2 Status of plant and animal records for Southern Province

	Woody plants	Animals*
Total number of records	21,946	6,784
Number of identified records	21,841	6,211
Number of unidentified records	105	573
Number of identified genera	341	244
Number of unidentified genera	13	0
Number of identified species	657	365
Number of unidentified species	27	29

*Selected groups (i.e. vertebrates, molluscs, butterflies)

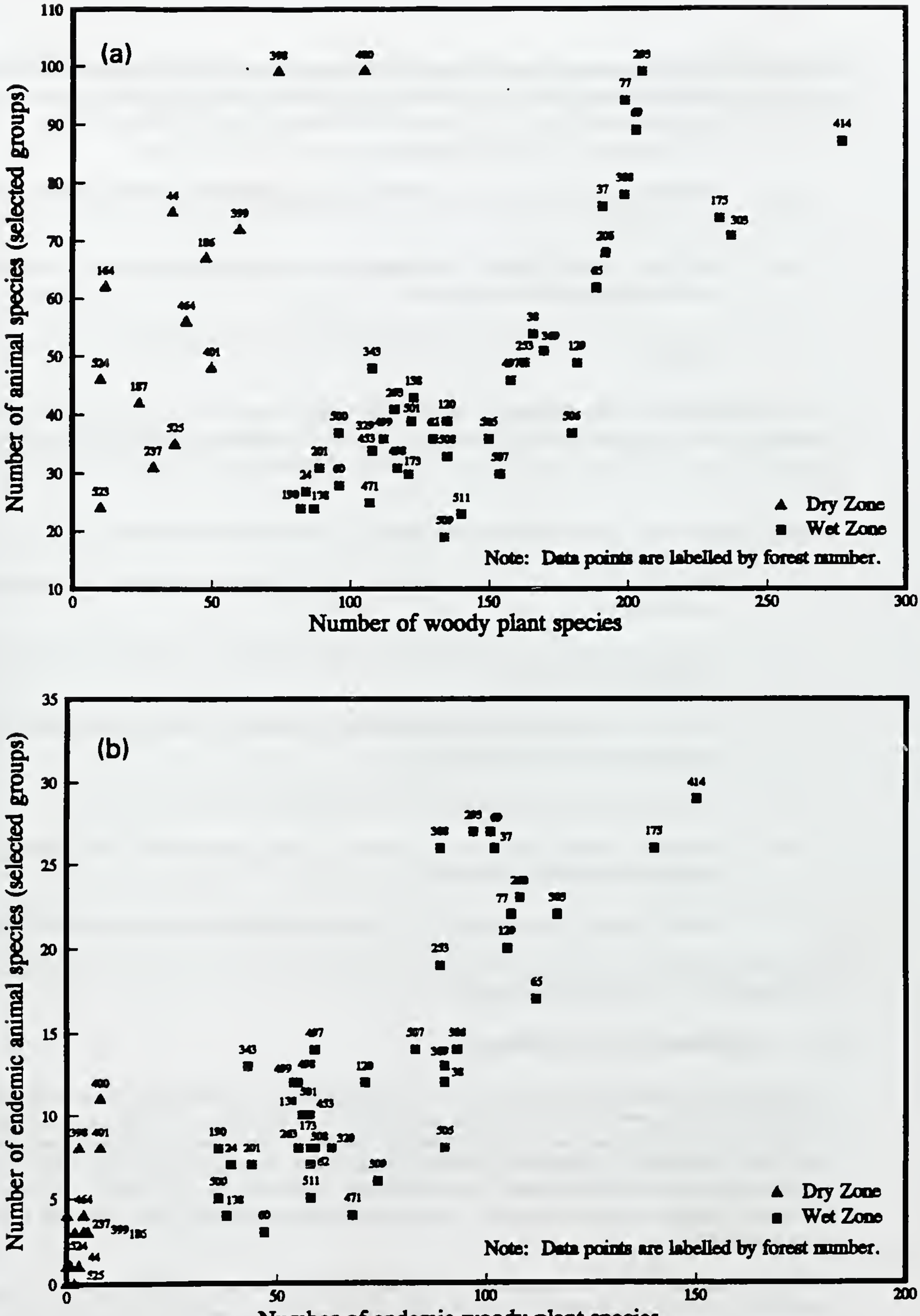


Figure 1 Relationship between animal and plant diversity for (a) species and (b) endemic species

represented in at least one forest complex using the woody plant data. It is achieved by means of an algorithm which comprises the following iterative procedure:

(i) The forest complex with the most species is selected as the first site.

(ii) The forest complex with most species not already represented in the first complex is selected as the second site.

(iii) The forest complex with the most species not already represented in the previously selected complexes is selected as the next site.

(iv) The previous step (iii) is repeated until all species are represented in one or more forest complexes.

Various modifications to this algorithm were explored to demonstrate the range of options available. For example, in order to reduce the risk of species extinctions, the algorithm was modified to ensure that each species is represented within at least two forest complexes. Another option is to restrict the analysis to endemic species.

A second algorithm was used to weight for rare species. This comprises the following steps:

(i) The forest complex with the most unique species (i.e. species recorded only in that site) is selected as the first site.

(ii) The forest complex with most unique species not already represented in the first complex is selected as the second site.

(iii) The forest complex with the most unique species not already represented in the previously selected complexes is selected as the next site.

(iv) The previous step (iii) is repeated until all unique species have been selected.

(v) The forest complex with the most species not already represented in the previously selected complexes is selected as the next site.

(vi) The previous step (v) is repeated until all species are represented in one or more forest complexes.

Having defined a minimum complex of forests with respect to woody plant diversity, it was optimised to ensure that faunal diversity is adequately represented.

1.2.2 Soil conservation and hydrology

The methodology is described in Part B (Section 2) of this document. It is designed to predict the potential soil erosion and flooding caused by conversion of natural forests to other forms of land use, and to assess their importance for protecting headwaters of river systems. Soil erosion and flood hazard are estimated in absolute terms, while importance for headwaters protection is based on a ranking procedure which takes into account the number of streamlets and catchments, and the distance to the outlet. Fog interception is not relevant to the present study because all forests lie below 1,500 m, the threshold below which interception of moisture from fog is insignificant.

A total of 45 natural forests in Southern Province were evaluated with respect to their role in soil conservation and hydrology. It includes all forests covered by the biological diversity study (see Table 1), with the exception of Sinharaja, Ruhuna Block 1 and the three mangroves (Kahanda, Kalametiya and Rekawa) in the Province and those forests lying in adjacent districts (Haycock, Kataragama and Ruhuna Blocks 2-4). Included in the total but not covered by the biological diversity study are Yakdehikanda and Keulakada Wewa (yet to be surveyed) and Mahapitikanda (too degraded to warrant surveying).

The results of this evaluation have been presented in a separate report (Gunawardena, 1993). The main findings have been incorporated within the present report, and integrated with the results of the biological diversity study. Complete integration is not yet possible because only 42 of the forests are common to both surveys.

2. BIOLOGICAL DIVERSITY ASSESSMENT

2.1 SPECIES DIVERSITY WITHIN INDIVIDUAL FORESTS

Species recorded within individual forests are listed in Annexes 1 and 2 for woody plants and selected animal groups, respectively. Many species of plants and animals have been recorded in new localities, extending their known distributions. Some rare species have been found to be more common than previously thought, and a number of woody species believed to have become extinct or not collected for a very long time have been recorded and collected for the first time this century. Two species of lizard have been discovered, and it is thought that the faunal collection awaiting identification may include one or more species of frog new to science. Details of some of the new locality records are given in Annexes 3 and 4 for plants and animals, respectively.

The total number of species recorded within each forest is summarised in Table 3 for (a) woody plants and (b) selected groups of animals[3]. Sinharaja, Nakiyadeniya, Kanneliya, Mulatiyana, Dellawa, Rammalakanda and Diyadawa are the most diverse forests for woody plants, with some 200 or more species recorded in each. All of these lie in the wet zone. The most diverse forest for woody plants in the dry zone is Ruhuna Block 3 with over 100 species (Table 3a). Mulatiyana, Diyadawa, Dellawa, Sinharaja and Rammalakanda are among the most diverse wet zone forests for animals, together with Ruhuna Blocks 1-3 and Bundala in the dry zone (Table 3b). All of these forests are among the largest and, with the exception of Bundala, are considered to have been adequately sampled (Table 1). The only adequately sampled forest that contains fewer woody plant and animal species than might be expected on account of its large size (> 1,000 ha) is Beraliya (Kudagala). This forest is twice the size of Bereliya (Akuressa) (Table 1) but supports markedly fewer species (Tables 3a,b).

Sinharaja contains both the greatest number of woody species (277) and endemic woody species (150). Together with Rammalakanda and Ruhuna Block 3, it has the most unique species (i.e. species not represented in any other site). Kanneliya is notable, having among the highest percentage of endemic woody species (60%) of any forest, as well as the most nationally and globally threatened woody species. Haycock, Oliyagankele and Welihena (all insufficiently sampled), with half the number of species, are also notable with respect to their high proportions of endemic and threatened woody species. Of the dry zone forests, Ruhuna Blocks 3-4 have the most endemic woody species (Table 3a).

Ruhuna Block 1 is marginally the most diverse forest for animals, closely followed by Ruhuna Block 3. Together with Ruhuna Block 4 (insuffiently sampled), they are the most important forests in the dry zone for endemic and threatened species of animals. Sinharaja has the most endemic and threatened species of animals, other important forests in this respect being Beraliya (Akuressa), Dellawa, Kanneliya, Mulatiyana and Rammalakanda. Haycock and Homadola (both insufficiently sampled), with much lower diversity, are notable for having the highest percentage (>40 %) of endemics (Table 3b).

2.2 INFLUENCE OF FOREST SIZE

2.2.1 Species diversity

In general, the larger the size of a forest, the greater the number of species contained within it up to a threshold which is a function of its complexity or heterogeneity. Such a trend is evident for woody plants (Figure 2a) and animals (Figure 2b), despite the limitation that many forests have not been adequately sampled (see Section 1.2.1). As discussed previously (Section 1.2.1), the distinction between wet and dry zone forests is marked in the case of woody plants but not animals. These data endorse the maxim that conservation areas should be as large as possible to maximise representation of species (see Part A, Section 1.5.1).

[3]Faunal statistics should be treated with caution because of sampling constraints (see Section 1.2.1).

Table 3(a) Summary of woody plant diversity recorded within natural forests in Southern Province. Forests are listed in descending order for species diversity, those in upper case having been adequately sampled. Species recorded within individual forests are listed in Annex 1.

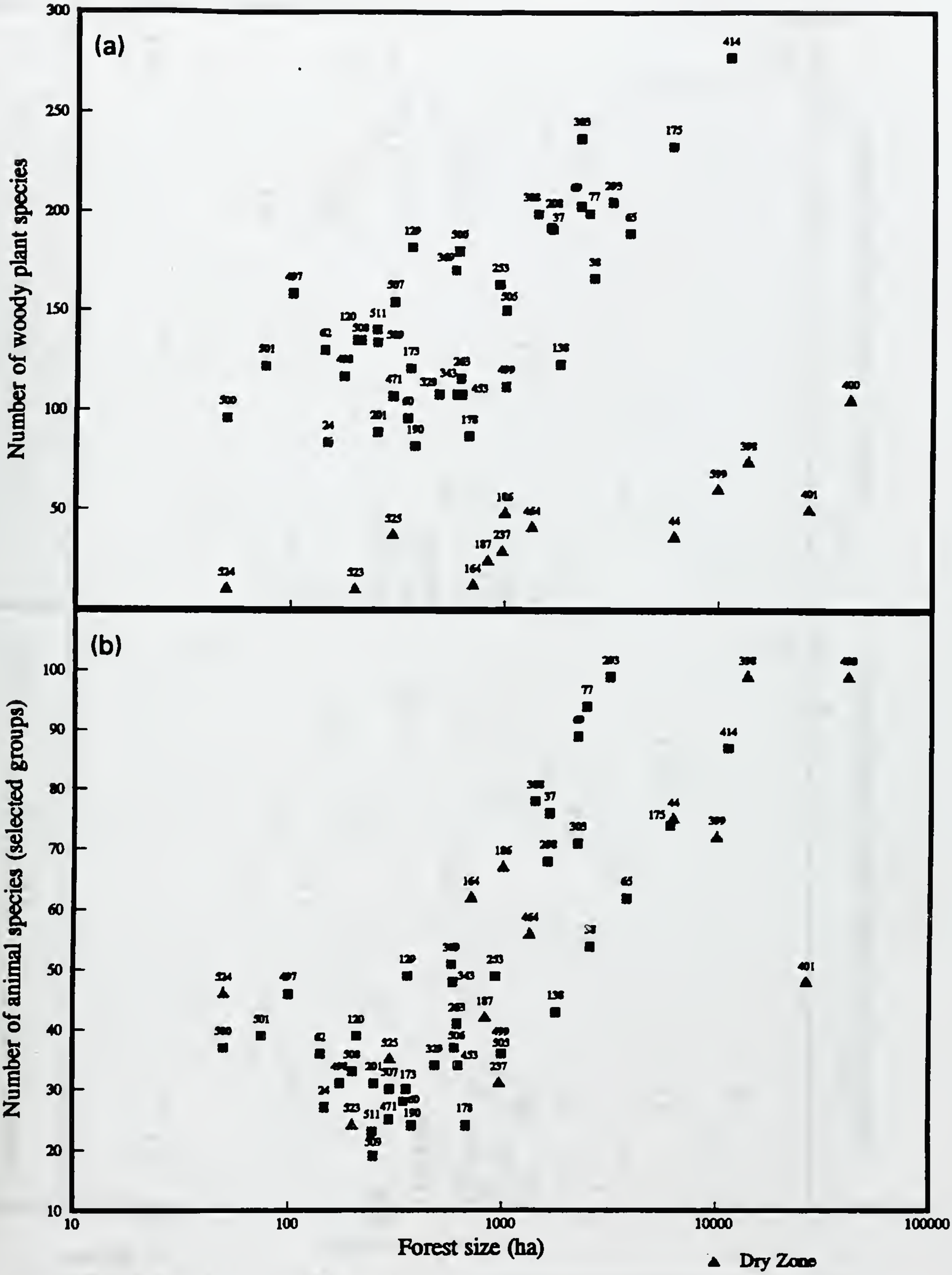
No.	Forest name	Families	Genera	Species	Species			
					Unique	Endemic	Threatened	
							National	Global
414	**SINHARAJA**	166	170	277	11	150	24	7
303	**NAKIYADENIYA**	161	164	237	5	117	24	11
175	**KANNELIYA**	147	149	233	2	140	26	16
293	**MULATIYANA**	149	151	205	8	97	18	6
69	**DELLAWA**	144	147	203	0	101	9	6
388	**RAMMALAKANDA**	141	148	199	11	89	12	6
77	**DIYADAWA**	138	142	199	1	106	16	6
208	**KOMBALA-KOTTAWA**	131	132	192	0	108	17	11
37	**BERALIYA (AKURESSA)**	136	137	191	2	102	15	6
65	**DEDIYAGALA**	126	126	189	1	112	18	10
129	Haycock	124	125	182	2	105	16	12
506	Tiboruwakota	129	130	180	1	93	16	6
369	**POLGAHAKANDA**	124	126	170	0	90	10	7
38	**BERALIYA (KUDAGALA)**	123	125	166	6	90	12	5
253	Malambure	125	128	163	1	89	13	7
497	Kalubowitiyana	126	129	158	4	59	10	4
507	Homadola	107	110	154	0	83	12	6
505	Tawalama	108	111	150	0	90	16	8
511	Bambarawana	114	117	140	1	58	8	6
120	Habarakada	101	104	135	0	71	9	2
508	Hindeinattu	114	117	135	0	59	11	6
509	Auwegalakanda	104	105	134	0	74	12	7
62	Darakulkanda	108	111	130	1	58	9	5
138	Horagala-Paragala	102	104	123	0	56	9	2
501	Aninkanda	99	101	122	2	57	6	3
173	Kandawattegoda	96	99	121	0	58	7	4
498	Kurulugala	89	90	117	5	55	6	3
263	Masmullekele	97	99	116	0	55	9	4
499	Silverkanda	86	86	112	4	54	6	3
329	Oliyagankele	82	85	108	2	63	10	6
453	Viharekele	87	90	108	0	58	9	2
343	Panilkanda	95	96	108	1	43	3	2
471	Welihena	78	81	107	0	68	13	5
400	[D]**RUHUNA BLOCK 3**	75	77	105	11	8	2	1
60	Dandeniya-Aparekka	81	83	96	2	47	7	2
500	Derangala	84	87	96	2	36	4	1
201	Kirinda Mahayayakele	72	74	89	0	44	6	2
178	Kanumuldeniya	77	79	87	0	38	4	2
24	Badullakele	72	73	84	0	39	7	3
190	Kekanadura	76	76	82	0	36	6	4
398	[D]**RUHUNA BLOCK 1**	58	59	74	8	3	1	1
399	[D]**RUHUNA BLOCK 2**	49	49	60	5	4	2	2
401	[D]Ruhuna Block 4	42	42	50	1	8	2	1
186	[D]Katagamuwa	41	41	48	2	5	0	1
464	[D]Wedasitikanda	32	34	41	4	4	1	1
525	[D]Miyandagala	29	29	37	4	2	1	1
44	[D]Bundala	34	35	36	5	3	0	0
237	[D]Madunagala	25	26	29	1	2	1	0
187	[D]Kataragama	20	21	24	1	0	0	0
164	[D]Kalametiya Kalapuwaʼ	12	12	12	0	0	0	0
524	[D]Rekawa Kalapuwaʼ	9	9	10	4	1	0	0
523	[D]**KAHANDA KALAPUWAʼ**	10	10	10	5	0	1	0

[D]Dry Zone (the rest are in the Wet Zone)
ʼMangrove

Table 3(b) Summary of diversity for selected groups of animals recorded within natural forests in Southern Province. Forests are listed in descending order for species diversity, those in upper case having been adequately sampled. Species recorded within individual forests are listed in Annex 2.

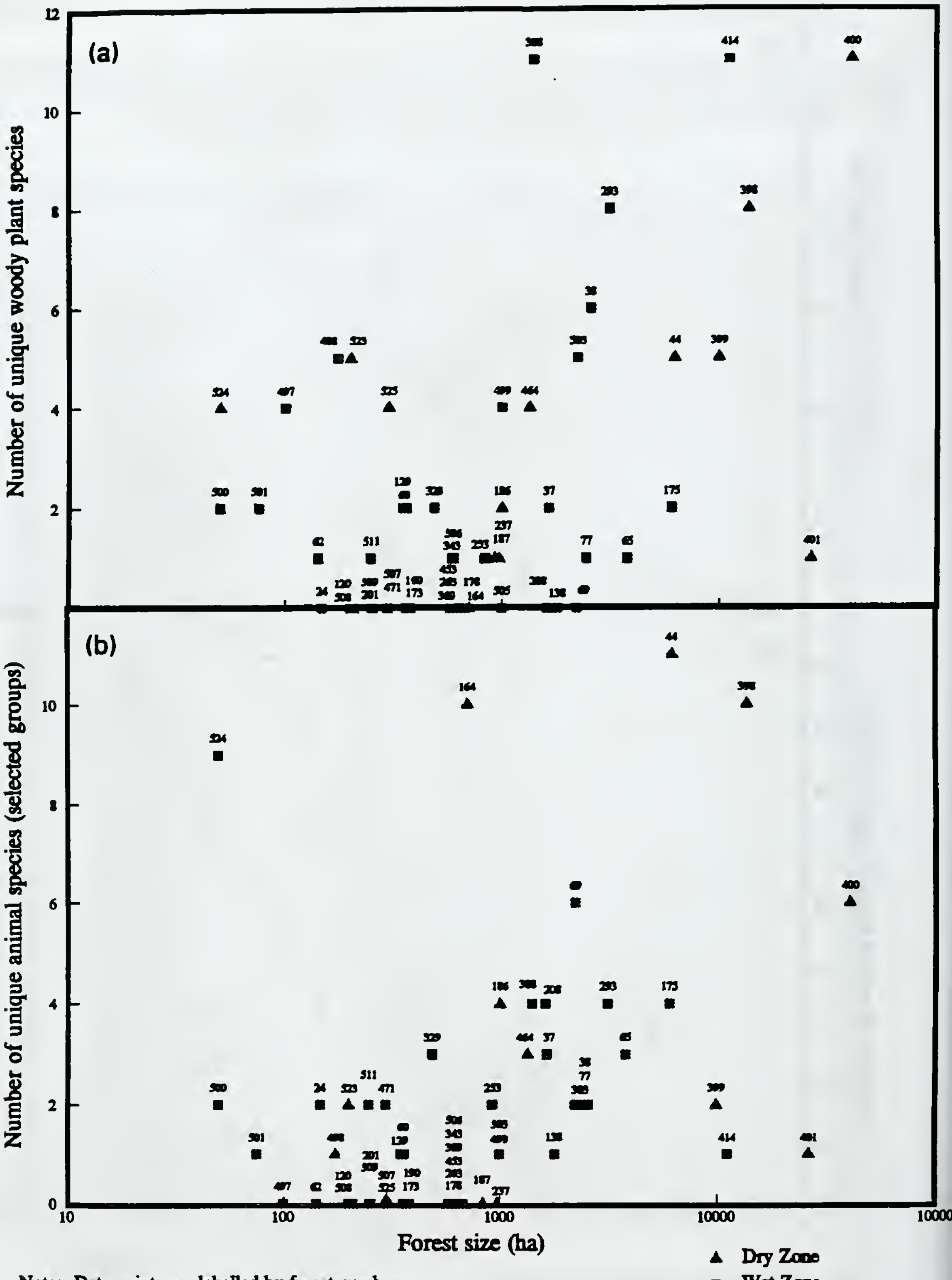
No.	Forest name	Families	Genera	Species	Species Unique	Species Endemic	Species Threatened National	Species Threatened Global
398	DRUHUNA BLOCK 1	78	84	96	10	8	15	6
400	DRUHUNA BLOCK 3	74	79	94	6	11	13	6
293	MULATIYANA	73	80	89	4	27	24	6
77	DIYADAWA	70	74	88	2	22	20	3
69	DELLAWA	64	71	82	5	27	26	5
414	SINHARAJA	64	68	77	1	29	31	5
44	DBundala	54	65	75	11	1	4	2
388	RAMMALAKANDA	60	64	72	3	26	23	3
399	DRUHUNA BLOCK 2	58	60	67	2	3	8	3
37	BERALIYA (AKURESSA)	56	60	67	3	26	21	4
186	DKatagamuwe	55	57	66	4	3	5	3
175	KANNELIYA	51	55	64	4	26	18	5
164	DKalametiya Kalapuwa'	52	55	62	10	1	2	0
303	NAKIYADENIYA	48	49	60	2	22	17	4
208	KOMBALA-KOTTAWA	43	47	57	3	23	19	8
464	DWedasitikanda	48	50	56	3	4	3	2
65	DEDIYAGALA	45	47	51	3	17	14	4
38	BERALIYA (KUDAGALA)	45	46	50	2	12	8	2
401	DRuhuna Block 4	39	41	47	1	8	9	5
524	DRekawa Kalapuwa'	34	37	45	9	1	1	0
369	POLGAHAKANDA	38	40	44	0	13	14	5
253	Malambure	37	38	43	1	19	11	4
129	Haycock	37	39	43	1	20	14	3
343	Panilkanda	36	39	42	0	13	13	2
497	Kelubowitiyana	34	34	40	0	14	9	2
187	DKataragama	37	38	40	0	4	7	2
138	Horagala-Paragala	32	33	38	0	10	9	0
263	Masmullekele	36	36	38	0	8	5	0
120	Habarakada	33	33	36	0	12	9	1
525	DMiyandagala	26	30	35	0	0	1	2
500	Derangala	28	29	35	2	5	6	1
501	Aninkanda	31	32	34	1	10	12	2
506	Tiboruwakota	28	28	33	0	14	10	0
505	Tawalama	28	29	32	1	8	8	3
499	Silverkanda	26	28	31	1	12	10	0
62	Darakulkanda	30	30	31	0	7	4	1
237	DMadunagala	27	27	31	0	3	4	2
329	Oliyagankele	26	29	30	3	8	5	2
498	Kurulugala	25	26	28	1	12	8	1
508	Hindeinattu	22	24	28	0	8	4	2
453	Viharekele	25	25	28	0	10	9	3
201	Kirinda Mahayayakele	24	25	27	0	7	6	1
507	Homadola	24	24	27	0	14	8	1
173	Kandawattegoda	24	25	26	0	8	3	1
523	DKAHANDA KALAPUWA'	21	21	24	2	0	0	0
471	Welihena	22	22	24	2	4	4	1
24	Badullakele	22	22	23	2	7	5	1
511	Bambarawana	19	19	22	2	5	2	1
60	Dandeniya-Aparekka	22	22	22	0	3	2	1
178	Kanumuldeniya	19	19	20	0	4	2	0
190	Kekanadure	17	17	20	0	8	5	0
509	Auwegalakanda	15	15	18	0	6	3	0

DDry Zone (the rest are in the Wet Zone)
'Mangrove



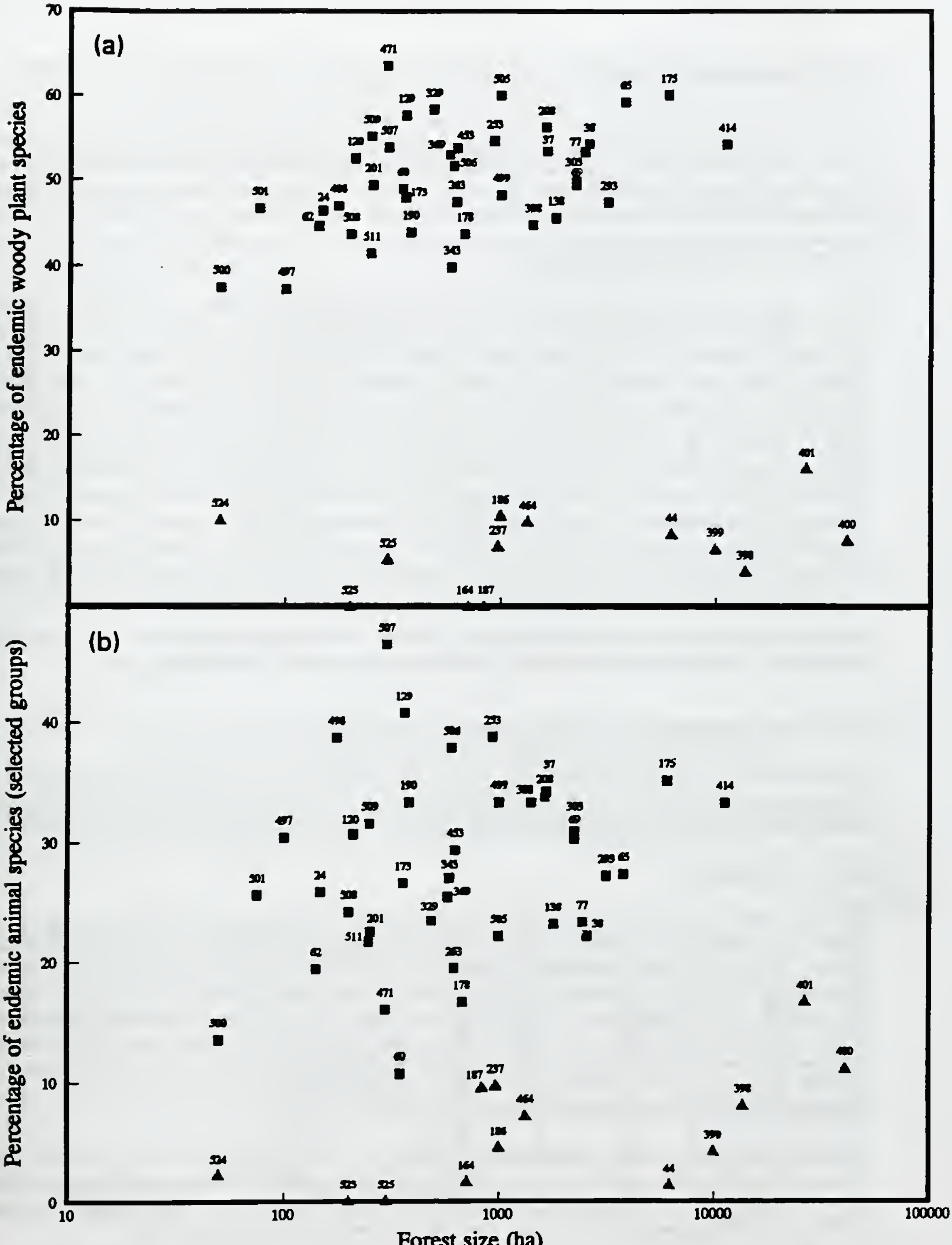
Note: Data points are labelled by forest number.

Figure 2 Relationship between species diversity and forest size for (a) woody plants and (b) selected animal groups



Note: Data points are labelled by forest number.

Figure 3 Relationship between the number of unique species and forest size for (a) woody plants and (b) selected animal groups



Note: Data points are labelled by forest number.

Figure 4 Relationship between the percentage of endemic species and forest size for (a) woody plants and (b) selected animal groups

2.2.2 Rare and endemic species

Many forests contain one or more rare species that are uniquely restricted in their distribution to that particular site (Tables 3a,b). There is no clear relationship between the number of species unique to a particular forest and its size in the case of either plants (Figure 3a) or animals (Figure 3b). **This emphasises the importance of protecting small, as well as large, forests in order to conserve the entire spectrum of species.** Kalubowitiyana [497] and the mangrove of Rekawa [524] are prime examples of small forests (< = 100 ha) with as many or more unique species than many larger forests (> 1,000 ha). Both are other state forests and, therefore, receive negligible legal protection.

Levels of endemism are high in wet zone forests, ranging from 37% to 64% for woody plants (Figure 4a) and from 14% to 52% for animals (Figure 4b). They are much lower, usually below 10%, in dry zone forests with the notable exception of Ruhuna Block 4 (insufficiently sampled) at about 16% for both woody plants and animals. While small forests tend to contain fewer endemic species than large forests, their proportion of endemics may be as high or even higher (Figure 4a,b). The 297 ha forest of Welihena [471] (insufficiently sampled), for example, ranks 33rd for woody plant diversity (Table 3a) but it has the highest proportion of endemics (64%), as shown in Figure 4a. Similarly, Homadola [507] (insufficiently sampled), covering some 300 ha and ranking 43rd for faunal diversity (Table 3b), has the highest proportion (52%) of endemic animals (Figure 4b). Other small forests with exceptionally high levels of animal endemism include Haycock [129] and Kurulugala [498], the latter being the type locality for a new species of lizard (*Ceratophora* sp. *nov.*) discovered during the NCR. As in the case of unique species, there is no clear relationship between levels of endemism and forest size for either woody plants (Figure 4a) or animals (Figure 4b), further emphasising the relative importance of small forests for endemic species.

In defining an optimal conservation areas network, therefore, **it is vital that small forests are not overlooked in deference to larger forests because they may be important for rare and endemic species.**

2.3 SPECIES DIVERSITY WITHIN FOREST COMPLEXES

In order to overcome problems of sample size, forests were amalgamated into 18 complexes (see Section 1.2.1). Each complex is numbered according to the number of one of its constituent forests. The biological diversity represented within each complex is summarised in Tables 4a and 4b for woody plants and animals, respectively.

2.3.1 Woody plants

The most diverse site for woody plants is KDN *et al.* (Kanneliya, Dediyagala, Nakiyadeniya and others), the largest of the complexes (13,400 ha). It also has the most endemic and threatened (nationally and globally) species. This is particularly remarkable since much of KDN has been logged for timber in the past. KDN is considered to be the most important lowland rain forest in the country, warranting strict protection (P.S. Ashton, *in litt.*, 1992). Sinharaja *et al.* (12,962 ha), second most diverse complex, contains most unique species among wet zone complexes. Also notable for its high complement of unique species is Horagala-Paragala/Mulatiyana/Rammalakanda (6,356 ha). Other highly diverse complexes, with over 250 species of woody plants, are Dellawa/Diyadawa/Kalubowitiyana (4,784 ha) and Habarakada/Haycock/Auwegalakanda/Bambarawana (1,070 ha) (Table 4a).

Of the dry zone forests, Ruhuna National Park (i.e. Blocks 1-4) is outstandingly important, with nearly twice as many woody species as any other dry zone forest and double the number of unique species compared to any dry or wet zone forest. Doubtless, this reflects its very large size (90,803 ha). The complex comprising Bundala and the three mangroves (9,172 ha) also contains many unique species (Table 4a).

2.3.2 Animals

Highest faunal diversity[3] was recorded in Ruhuna National Park, followed by Bundala/Mangroves. Together, these two complexes account for over half of the 129 species unique to a particular complex. Of the wet zone complexes, the most diverse are KDN *et al.*, Horagala-Paragala/Mulatiyana/Rammalakanda,

Table 4(a) Summary of woody plant diversity recorded within natural forest complexes in Southern Province. Forest complexes are listed in descending order for species diversity.

Forest complex No.	Subsidiary nos.	Name	Families	Genera	Species	Species: Unique	Species: Endemic	Species: Threatened National	Species: Threatened Global
175	65,303,500,505,507,508	KDN et al.	203	207	357	12	185	43	19
414	498,499,506	Sinharaja et al.	194	198	337	28	173	31	11
138	293,388	Hora-Para/Mula/Ram	191	196	293	21	131	22	8
69	77,497	Della/Diya/Kalu	190	194	290	6	133	21	8
120	129,509,511	Haba/Hay/Auw/Bamb	177	179	263	3	131	23	13
253	369	Malam/Polga	148	150	211	1	113	17	9
38	62	Berel/Daru	147	149	211	7	104	16	7
173	208	Kanda/Komb-Kott	142	144	210	0	112	18	11
37		Beraliya (Akuressa)	136	137	191	2	102	15	6
343	501	Panil/Anin	126	128	155	4	70	7	3
329	471	Oliy/Weli	97	100	145	2	89	18	8
60	190,201	Dand/Keka/Kiri	112	112	145	3	73	13	5
398	399,400,401	[D]Ruhuna NP	100	103	143	56	13	5	2
24	263	Badu/Masmu	111	112	142	0	66	12	6
178	453	Kanu/Vihi	103	106	128	0	65	10	3
186	187,464	[D]Kata/Kata/Weda	59	61	75	10	7	1	2
237	525	[D]Madu/Miya	45	45	55	5	3	1	1
44	164,523,524	[D]Bund/Mangroves	49	49	53	21	4	1	0

[D]Dry Zone (the rest are in the wet zone)

Table 4(b) Summary of animal diversity (selected groups) recorded within natural forest complexes in Southern Province. Forest complexes are listed in descending order for species diversity.

Forest complex No.	Subsidiary nos.	Name	Families	Genera	Species	Species: Unique	Species: Endemic	Species: Threatened National	Species: Threatened Global
398	399,400,401	[D]Ruhuna NP	119	122	145	27	14	20	8
44	164,523,524	[D]Bund/Mangroves	95	107	133	41	2	6	2
175	65,303,500,505,507,508	KDN et al.	92	96	128	12	41	32	9
69	77,497	Della/Diya/Kalu	91	97	119	9	35	34	6
138	293,388	Hora-Para/Mula/Ram	92	103	119	7	39	37	7
414	498,499,506	Sinharaja et al.	86	90	106	6	41	33	5
186	187,464	[D]Kata/Kata/Weda	88	90	106	7	7	10	4
173	208	Kanda/Komb-Kott	54	57	68	3	26	20	8
120	129,509,511	Haba/Hay/Auw/Bamb	56	59	67	3	26	19	4
37		Beraliya (Akuressa)	56	60	67	3	26	21	4
253	369	Malam/Polga	55	57	64	1	23	20	7
38	62	Berel/Daru	54	57	63	2	16	10	3
237	525	[D]Madu/Miya	39	43	54	0	3	4	3
343	501	Panil/Anin	47	50	54	1	17	18	2
329	471	Oliy/Weli	40	42	46	5	11	8	3
24	263	Badu/Masmu	43	44	46	2	10	6	1
60	190,201	Dand/Keka/Kiri	38	39	45	0	13	10	1
178	453	Kanu/Vihi	34	34	37	0	13	11	3

[D]Dry Zone (the rest are in the wet zone)

Table 5(a) Network of forest complexes required to conserve woody plant diversity in Southern Province. Forest complexes are ranked in descending order of their selection, based on their contribution of species to the network. Those below the dotted line do not contribute any additional species to the network.

Forest complex				Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	New	%	Total	%	Total
1	175	65,303,500,505,507,508	KDN et al.	357	54.3	357	54.3	300
2	398	399,400,401	[D]Ruhuna NP	118	18.0	475	72.3	182
3	414	498,499,506	Sinharaja et al.	60	9.1	535	81.4	122
4	138	293,388	Hora-Para/Mula/Ram	35	5.3	570	86.8	87
5	44	164,523,524	[D]Bund/Mangroves	23	3.5	593	90.3	64
6	186	187,464	[D]Kata/Kata/Weda	16	2.4	609	92.7	48
7	69	77,497	Della/Diya/Kalu	12	1.8	621	94.5	36
8	38	62	Berel/Daru	11	1.7	632	96.2	25
9	60	190,201	Dand/Keka/Kiri	5	0.8	637	97.0	20
10	237	525	[D]Madu/Miya	5	0.8	642	97.7	15
11	120	129,509,511	Haba/Hay/Auw/Bamb	4	0.6	646	98.3	11
12	329	471	Oliy/Weli	4	0.6	650	98.9	7
13	343	501	Panil/Anin	4	0.6	654	99.5	3
14	37		Beraliya (Akuressa)	2	0.3	656	99.8	1
15	253	369	Malam/Polga	1	0.2	657	100.0	0
- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
16	178	453	Kanu/Vihi	0	0.0	657	100.0	0
17	173	208	Kanda/Komb-Kott	0	0.0	657	100.0	0
18	24	263	Badu/Masmu	0	0.0	657	100.0	0

[D]Dry Zone (the rest are in the wet zone)

Table 5(b) Network of forest complexes required to conserve woody plant diversity in Southern Province. Forest complexes are ranked in descending order of their selection, based on their contribution of unique species to the network. Those below the dotted line do not contribute any additional unique species to the network.

Forest complex				Unique species	Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	Total	New	%	Total	%	Total
1	398	399,400,401	[D]Ruhuna NP	56	143	21.8	143	21.8	514
2	414	498,499,506	Sinharaja et al.	28	319	48.6	462	70.3	195
3	44	164,523,524	[D]Bund/Mangroves	21	25	3.8	487	74.1	170
4	138	293,388	Hora-Para/Mula/Ram	21	55	8.4	542	82.5	115
5	175	65,303,500,505,507,508	KDN et al.	12	51	7.8	593	90.3	64
6	186	187,464	[D]Kata/Kata/Weda	10	16	2.4	609	92.7	48
7	38	62	Berel/Daru	7	11	1.7	620	94.4	37
8	69	77,497	Della/Diya/Kalu	6	12	1.8	632	96.2	25
9	237	525	[D]Madu/Miya	5	5	0.8	637	97.0	20
10	343	501	Panil/Anin	4	4	0.6	641	97.6	16
11	60	190,201	Dand/Keka/Kiri	3	5	0.8	646	98.3	11
12	120	129,509,511	Haba/Hay/Auw/Bamb	3	4	0.6	650	98.9	7
13	37		Beraliya (Akuressa)	2	3	0.5	653	99.4	4
14	329	471	Oliy/Weli	2	3	0.5	656	99.8	1
15	253	369	Malam/Polga	1	1	0.2	657	100.0	0
- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
16	178	453	Kanu/Vihi	0	0	0.0	657	100.0	0
17	173	208	Kanda/Komb-Kott	0	0	0.0	657	100.0	0
18	24	263	Badu/Masmu	0	0	0.0	657	100.0	0

[D]Dry Zone (the rest are in the wet zone)

Table 6(a) Network of forest complexes required to conserve endemic woody plant diversity in Southern province. Forest complexes are ranked in descending order of their selection, based on their contribution of endemic species to the network. Those below the dotted line do not contribute any additional species to the network.

Forest complex				Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	New	%	Total	%	Total
1	175	65,303,500,505,507,508	KDN et al.	185	73.7	185	73.7	66
2	414	498,499,506	Sinharaja et al.	26	10.4	211	84.1	40
3	138	293,388	Nora-Para/Mula/Ram	12	4.8	223	88.8	28
4	38	62	Berel/Daru	6	2.4	229	91.2	22
5	398	399,400,401	[D]Ruhuna NP	6	2.4	235	93.6	16
6	60	190,201	Oand/Keka/Kiri	5	2.0	240	95.6	11
7	329	471	Oliy/Weli	4	1.6	244	97.2	7
8	253	369	Malam/Polga	2	0.8	246	98.0	5
9	343	501	Panil/Anin	2	0.8	248	98.8	3
10	44	164,523,524	[D]Bund/Mangroves	1	0.4	249	99.2	2
11	120	129,509,511	Naba/Nay/Auw/Bamb	1	0.4	250	99.6	1
12	186	187,464	[D]Kata/Kata/Weda	1	0.4	251	100.0	0
13	237	525	[D]Madu/Miya	0	0.0	251	100.0	0
14	178	453	Kanu/Vihi	0	0.0	251	100.0	0
15	173	208	Kanda/Komb-Kott	0	0.0	251	100.0	0
16	69	77,497	Della/Diya/Kalu	0	0.0	251	100.0	0
17	24	263	Badu/Masmu	0	0.0	251	100.0	0
18	37		Beraliya (Akuressa)	0	0.0	251	100.0	0

[D]Dry Zone (the rest are in the wet zone)

Table 6(b) Network of forest complexes required to conserve endemic woody plant diversity in Southern province. Forest complexes are ranked in descending order of their selection, based on their contribution of unique endemic species to the network. Those below the dotted line do not contribute any additional unique species to the network.

Forest complex				Unique species	Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	Total	New	%	Total	%	Total
1	414	498,499,506	Sinharaja et al.	15	173	68.9	173	68.9	78
2	138	293,388	Nora-Para/Mula/Ram	8	18	7.2	191	76.1	60
3	175	65,303,500,505,507,508	KDN et al.	5	32	12.7	223	88.8	28
4	398	399,400,401	[D]Ruhuna NP	5	6	2.4	229	91.2	22
5	38	62	Berel/Daru	2	6	2.4	235	93.6	16
6	60	190,201	Oand/Keka/Kiri	2	5	2.0	240	95.6	11
7	329	471	Oliy/Weli	2	4	1.6	244	97.2	7
8	343	501	Panil/Anin	2	2	0.8	246	98.0	5
9	44	164,523,524	[D]Bund/Mangroves	1	1	0.4	247	98.4	4
10	120	129,509,511	Naba/Nay/Auw/Bamb	1	1	0.4	248	98.8	3
11	186	187,464	[D]Kata/Kata/Weda	1	1	0.4	249	99.2	2
12	253	369	Malam/Polga	1	2	0.8	251	100.0	0
13	237	525	[D]Madu/Miya	0	0	0.0	251	100.0	0
14	178	453	Kanu/Vihi	0	0	0.0	251	100.0	0
15	173	208	Kanda/Komb-Kott	0	0	0.0	251	100.0	0
16	69	77,497	Della/Diya/Kalu	0	0	0.0	251	100.0	0
17	24	263	Badu/Masmu	0	0	0.0	251	100.0	0
18	37		Beraliya (Akuressa)	0	0	0.0	251	100.0	0

[D]Dry Zone (the rest are in the wet zone)

Table 7 Contribution of woody plant species and endemic woody plant from individual forests to forest complexes. Forests are listed in the order of their selection for woody plant species, those in upper case having been adequately sampled.

Forest		Species			Endemic species		
No.	Name	Rank	No.	%	Rank	No.	%
303: KDN et al.							
303	NAKIYADENIYA	1	237	66.4	2	24	13.0
175	KANNELIYA	2	71	19.9	1	140	75.7
065	DEDIYAGALA	3	17	4.8	3	10	5.4
500	Derangala	4	12	3.4	5	3	1.6
508	Hindeinattu	5	9	2.5	6	2	1.1
505	Tawalama	6	7	2.0	4	4	2.2
507	Homadola	7	4	1.1	7	2	1.1
Species totals			**357**			**185**	
414: SINHARAJA et al.							
414	SINHARAJA	1	277	82.2	1	150	86.7
506	Tiboruwakota	2	29	8.6	3	8	4.6
499	Silverkanda	3	21	6.2	4	4	2.3
498	Kurulugala	4	10	3.0	2	11	6.4
Species totals			**337**			**173**	
138: HORA-PARA/MULA/RAM							
293	MULATIYANA	1	205	70.0	1	97	74.0
388	RAMMALAKANDA	2	71	24.2	2	27	20.6
138	Horagala-Paragala	3	17	5.8	3	7	5.3
Species totals			**293**			**131**	
69: DELLA/DIYA/KALU							
69	DELLAWA	1	203	70.0	2	19	14.3
497	Kalubowitiyana	2	49	16.9	3	8	6.0
77	DIYADAWA	3	38	13.1	1	106	79.7
Species totals			**290**			**133**	
120: HABA/HAY/AUW/BAMB							
129	Haycock	1	182	69.2	1	105	80.2
511	Bambarawana	2	49	18.6	3	9	6.9
509	Auwegalakanda	3	20	7.6	4	5	3.8
120	Habarakada	4	12	4.6	2	12	9.2
Species totals			**263**			**131**	
253: MALAM/POLGA							
369	POLGAHAKANDA	1	170	80.6	1	90	79.6
253	Malambure	2	41	19.4	2	23	20.4
Species totals			**211**			**113**	
38: BEREL/DARU							
38	BERELIYA (KUDAGALA)	1	166	78.7	1	90	86.5
62	Darakulkanda	2	45	21.3	2	14	13.5
Species totals			**211**			**104**	
173: KANDA/KOMB-KOTT							
208	KOMBALA-KOTTAWA	1	192	91.4	1	108	96.4
173	Kandawattegoda	2	18	8.6	2	4	3.6
Species totals			**210**			**112**	
37: BERELIYA (AKURESSA)							
37	BERELIYA (AKURESSA)		191			102	

343: PANIL/ANIN							
501	Aninkanda	1	122	78.7	1	57	81.4
343	Panilkanda	2	33	11.3	2	13	18.6
Species totals			**155**			**70**	
329: OLIY/WELI							
329	Oliyagankele	1	108	74.5	2	21	23.6
471	Welihena	2	37	25.5	1	68	76.4
Species totals			**145**			**89**	
60: DAND/KEKA/KIRI							
60	Dandeniya-Aparekka	1	96	66.2	1	47	64.4
190	Kekanadura	2	29	20.0	3	10	13.7
201	Kirinda Mahayayakele	3	20	13.8	2	16	21.9
Species totals			**145**			**73**	
398: RUHUNA NP							
400	RUHUNA BLOCK 3	1	105	73.4	1	8	61.5
398	RUHUNA BLOCK 1	2	27	18.9	2	2	15.4
399	RUHUNA BLOCK 2	3	7	4.9	4	1	7.7
401	Ruhuna Block 4	4	4	2.8	3	2	15.4
Species totals			**143**			**13**	
24: BADU/MASMU							
263	Masmullekele	1	116	81.7	1	55	83.3
24	Badullakele	2	26	18.3	2	11	16.7
Species totals			**142**			**66**	
178: KANU/VIHI							
453	Viharekele	1	108	84.4	1	58	89.2
178	Kanumuldeniya	2	20	15.6	2	7	10.8
Species totals			**128**			**65**	
186: KATA/KATA/WEDA							
186	Katagamuwa	1	48	64.0	1	5	71.4
464	Wedasitikanda	2	22	29.3	2	2	28.6
187	Kataragama	3	5	6.7	3	0	0.0
Species totals			**75**			**7**	
237: MADU/MIYA							
525	Miyandagala	1	37	67.3	2	1	33.3
237	Madunagala	2	18	32.7	1	2	66.7
Species totals			**55**			**3**	
44: BUND/MANGROVES							
44	Bundala	1	36	67.9	1	3	75.0
523	KAHANDA KALAPUWA	2	10	18.9	3	0	0.0
524	Rekawa Kalapuwa	3	5	9.4	2	1	25.0
164	Kalametiya Kalapuwa	4	2	3.8	4	0	0.0
Species totals			**53**			**4**	

Table 8(a) Network of forest complexes required to conserve woody plant diversity in Southern Province, with species represented in at least two complexes. Forest complexes are ranked in descending order of their selection, based on their contribution of species to the network.

Forest complex				Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	New	%	Total	%	Total
1	175	65,303,500,505,507,508	KDN et al.	0	0.0	0	0.0	657
2	414	498,499,506	Sinharaja et al.	274	41.7	274	41.7	383
3	398	399,400,401	[D]Ruhuna NP	13	2.0	287	43.7	370
4	138	293,388	Nora-Para/Mula/Ram	42	6.4	329	50.1	328
5	186	187,464	[D]Kata/Kata/Weda	40	6.1	369	56.2	288
6	69	77,497	Della/Diya/Kalow	26	4.0	395	60.1	262
7	44	164,523,524	[D]Bund/Mangroves	9	1.4	404	61.5	253
8	38	62	Berel/Daru	14	2.1	418	63.6	239
9	237	525	[D]Madu/Miya	14	2.1	432	65.8	225
10	120	129,509,511	Haba/Hay/Auw/Bamb	13	2.0	445	67.7	212
11	60	190,201	Dand/Keka/Kiri	6	0.9	451	68.6	206
12	37		Beraliya (Akuressa)	5	0.8	456	69.4	201
13	173	208	Kande/Komb-Kott	7	1.1	463	70.5	194
14	329	471	Oliy/Weli	5	0.8	468	71.2	189
15	343	501	Panil/Anin	2	0.3	470	71.5	187
16	253	369	Malam/Polga	4	0.6	474	72.1	183
17	24	263	Badu/Masmu	1	0.2	475	72.3	182
18	178	453	Kanu/Vihi	1	0.2	476	72.5	181

[D]Dry Zone (the rest are in the wet zone)

Table 8(b) Network of forest complexes required to conserve endemic woody plant diversity in Southern Province, with endemic species represented in at least two complexes. Forest complexes are ranked in descending order of their selection, based on their contribution of endemic species to the network.

Forest complex				Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	New	%	Total	%	Total
1	175	65,303,500,505,507,508	KDN et al.	0	0.0	0	0.0	251
2	414	498,499,506	Sinharaja et al.	147	58.6	147	58.6	104
3	138	293,388	Nora-Para/Mula/Ram	11	4.4	158	62.9	93
4	38	62	Berel/Daru	11	4.4	169	67.3	82
5	120	129,509,511	Haba/Hay/Auw/Bamb	10	4.0	179	71.3	72
6	60	190,201	Dand/Keka/Kiri	4	1.6	183	72.9	68
7	173	208	Kande/Komb-Kott	6	2.4	189	75.3	62
8	398	399,400,401	[D]Ruhuna NP	1	0.4	190	75.7	61
9	69	77,497	Della/Diya/Kalow	5	2.0	195	77.7	56
10	329	471	Oliy/Weli	2	0.8	197	78.5	54
11	44	164,523,524	[D]Bund/Mangroves	2	0.8	199	79.3	52
12	253	369	Malam/Polga	2	0.8	201	80.1	50
13	343	501	Panil/Anin	1	0.4	202	80.5	49
14	37		Beraliya (Akuressa)	2	0.8	204	81.3	47
15	186	187,464	[D]Kata/Kata/Weda	1	0.4	205	81.7	46
16	24	263	Badu/Masmu	1	0.4	206	82.1	45
17	178	453	Kanu/Vihi	0	0.0	206	82.1	45
18	237	525	[D]Madu/Miya	0	0.0	206	82.1	45

[D]Dry Zone (the rest are in the wet zone)

Table 9(a) Network of forest complexes required to conserve faunal diversity in Southern Province. Forest complexes are ranked in descending order of their selection, based on their contribution of species to the network. Those below the dotted line do not contribute any additional species to the network.

Forest complex				Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	New	%	Total	%	Total
1	398	399,400,401	[D]Ruhuna NP	145	39.7	145	39.7	220
2	175	65,303,500,505,507,508	KDN et al.	75	20.5	220	60.3	145
3	44	164,523,524	[D]Bund/Mangroves	59	16.2	279	76.4	86
4	69	77,497	Della/Diya/Kalu	30	8.2	309	84.7	56
5	138	293,388	Hora-Para/Mula/Ram	16	4.4	325	89.0	40
6	414	498,499,506	Sinharaja et al.	11	3.0	336	92.1	29
7	186	187,464	[D]Kata/Kata/Weda	7	1.9	343	94.0	22
8	329	471	Oliy/Weli	6	1.6	349	95.6	16
9	173	208	Kanda/Komb-Kott	4	1.1	353	96.7	12
10	37		Beraliya (Akuressa)	3	0.8	356	97.5	9
11	120	129,509,511	Haba/Hay/Auw/Bamb	3	0.8	359	98.4	6
12	24	263	Badu/Masmu	2	0.5	361	98.9	4
13	38	62	Berel/Daru	2	0.5	363	99.5	2
14	253	369	Malam/Polga	1	0.3	364	99.7	1
15	343	501	Panil/Anin	1	0.3	365	100.0	0
- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
16	237	525	[D]Madu/Miya	0	0.0	365	100.0	0
17	178	453	Kanu/Vihi	0	0.0	365	100.0	0
18	60	190,201	Dand/Keka/Kiri	0	0.0	365	100.0	0

[D]Dry Zone (the rest are in the wet zone)

Table 9(b) Network of forest complexes required to conserve endemic faunal diversity in Southern Province. Forest complexes are ranked in descending order of their selection, based on their contribution of endemic species to the network. Those below the dotted line do not contribute any additional endemic species to the network.

Forest complex				Protected species				Unprotected species
Rank	No.	Subsidiary nos	Name	New	%	Total	%	Total
1	175	65,303,500,505,507,508	KDN et al.	41	49.4	41	49.4	42
2	138	293,388	Hora-Para/Mula/Ram	13	15.7	54	65.1	29
3	69	77,497	Della/Diya/Kalu	9	10.8	63	75.9	20
4	398	399,400,401	[D]Ruhuna NP	9	10.8	72	86.7	11
5	414	498,499,506	Sinharaja et al.	6	7.2	78	94.0	5
6	173	208	Kanda/Komb-Kott	2	2.4	80	96.4	3
7	37		Beraliya (Akuressa)	1	1.2	81	97.6	2
8	44	164,523,524	[D]Bund/Mangroves	1	1.2	82	98.8	1
9	329	471	Oliy/Weli	1	1.2	83	100.0	0
- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
10	343	501	Panil/Anin	0	0.0	83	100.0	0
11	253	369	Malam/Polga	0	0.0	83	100.0	0
12	237	525	[D]Madu/Miya	0	0.0	83	100.0	0
13	186	187,464	[D]Kata/Kata/Weda	0	0.0	83	100.0	0
14	178	453	Kanu/Vihi	0	0.0	83	100.0	0
15	120	129,509,511	Haba/Hay/Auw/Bamb	0	0.0	83	100.0	0
16	60	190,201	Dand/Keka/Kiri	0	0.0	83	100.0	0
17	38	62	Berel/Daru	0	0.0	83	100.0	0
18	24	263	Badu/Masmu	0	0.0	83	100.0	0

[D]Dry Zone (the rest are in the wet zone)

Dellawa/Diyadawa/Kalubowitiyana, and Sinharaja *et al.* in descending order. KDN *et al.*, Horagala-Paragala/Mulatiyana/Rammalakanda and Sinharaja *et al.* are similarly the most important complexes for endemic and threatened species. KDN *et al.* and Dellawa/Diyadawa/Kalubowitiyana hold the most unique species (Table 4b).

2.4 DEFINING A MINIMUM CONSERVATION AREAS NETWORK

The results of applying the two algorithms described in Section 1.2.1 to the woody plant data are presented in Tables 5a,b. A total of 15 forest complexes, covering 63,798 ha or 11.6% of Southern Province, are required in order that each species is represented at least once. The same network is selected irrespective or whether or not the iterative procedure is weighted for rarity (i.e. unique species), although the order in which complexes are selected differs. The three complexes which do not contribute any additional species to the network are Badullakele/Masmullekele[237], Kandawattegoda/Kombala-Kottawa[173] and Kanumuldeniya/Viharekele[178].

Similarly, if the algorithms are constrained to endemic woody species, only 12 complexes are necessary irrespective of any weighting for rarity (Tables 6a,b). They cover a total area of 56,093 ha or 10.2% of the Province. The three additionally redundant complexes are Beraliya (Akuressa) [37], Dellawa/Diyadawa/Kalubowitiyana [69] and Madunagala/Miyandagala [237].

In order to check for redundancy within forest complexes, the first algorithm was applied to each complex to assess the contribution from each forest in terms of species and endemic species of woody plants. There are no cases of redundant forests with respect to woody species and only three cases with respect to woody endemics, namely Kataragama and two of the mangroves, Kahanda and Kalametiya (Table 7). Neither Kataragama nor Kalametiya, however, was adequately sampled. This result underlines the unique importance of most forests, based on surveys conducted to date.

While it is sound conservation practice to ensure that each species is represented in at least two forest complexes, this condition cannot be met for either all woody species (Table 8a) or endemics (Table 8b). Even if all 18 complexes are protected, only 73% of woody species or 82% of endemic woody species would be represented within at least two complexes. It may be unrealistic, however, to attempt to meet this criterion as certain species may prove to be extremely localised in their distribution. This will only become apparent as forests in adjacent districts are surveyed.

2.5 OPTIMISING THE CONSERVATION AREAS NETWORK FOR FAUNA

In the previous section, minimum networks of 15 and 12 forest complexes were identified for 100% representation of woody species and endemic woody species, respectively. These networks (Tables 5a and 6a) are very similar to those identified for 100% representation of animal species (Table 9a) and endemic animal species (Table 9b). In order to achieve 100% representation of both woody plants and animals, the total number of complexes required is 17, covering 6,6547 ha or 12.1% of the Province. Kanumuldeniya/Viharekele [178] in the wet zone is the only redundant complex not contributing any additional diversity. Complete representation of endemic plants and animals is achieved with 15 complexes, covering 64,206 ha or 11.7% of the province. Redundant complexes are Kanumuldeniya/Viharekele [178] and Badullakele/Masmullekele [24] in the wet zone, and Madunagala/Miyandagala [237] in the dry zone.

2.6 COMPARISON BETWEEN ACR AND NCR

Early on in the NCR, it was decided to re-survey all natural forests previously covered by the ACR to ensure consistency in data collection. To date, 15 forests have been re-surveyed. A comparison between the two surveys shows that in all but one case (Viharekele) more woody species have consistently been recorded in the NCR than in the ACR (Table 10). The marginally greater number of species recorded in the ACR than the NCR in Viharekele probably reflects the fact that this site, along with Kekanadure and Oliyagankele, was surveyed twice during the ACR (A.H.M. Jayasuriya, pers. comm.).

Table 10 Comparison between ACR and NCR for woody plant species and endemic woody plant species recorded in forests in Southern Province.

No	Name of forest	Endemism	Common to both (%)	Unique to ACR (%)	Unique to NCR (%)	Total spp.
37	Beraliya (Akuressa):	all spp.	27.9	8.2	63.9	208
		endemic spp.	31.3	3.0	65.7	99
38	Beraliya (Kudagala):	all spp.	27.9	18.6	53.4	204
		endemic spp.	32.7	14.3	53.1	98
60	Dandeniya-Aparekka:	all spp.	31.3	26.7	42.0′	131
		endemic spp.	25.9	16.7	57.4′	54
69	Dellawa:	all spp.	34.8	17.8	47.4	247
		endemic spp.	46.5	16.7	36.8	114
77	Diyadawa:	all spp.	34.5	16.4	49.2	238
		endemic spp.	38.1	14.4	47.5	118
173	Kandawattegoda:	all spp.	29.7	26.7	43.6′	165
		endemic spp.	29.7	31.1	39.2′	74
190	Kekanadura:	all spp.	36.1	24.1	39.8′	108
		endemic spp.	33.3	22.2	44.4′	45
201	Kirinda Mahayayakele:	all spp.	26.6	30.5	43.0′	128
		endemic spp.	32.1	20.8	47.2′	53
208	Kombala-Kottawa:	all spp.	36.4	14.7	48.9	225
		endemic spp.	43.5	13.0	43.5	115
263	Masmullekele:	all spp.	41.1	28.8	30.1′	163
		endemic spp.	39.4	25.4	35.2′	71
329	Oliyagankele:	all spp.	37.3	29.4	33.3′	153
		endemic spp.	37.5	27.5	35.0′	80
343	Panilkanda:	all spp.	32.1	22.9	45.0′	140
		endemic spp.	32.1	26.4	41.5′	53
369	Polgahakanda:	all spp.	23.6	14.6	61.8	199
		endemic spp.	26.3	15.2	58.6	99
453	Viharekele:	all spp.	40.3	32.1	27.7′	159
		endemic spp.	44.0	28.0	28.0′	75
471	Welihena:	all spp.	28.5	13.0*	58.5′	123
		endemic spp.	28.6	8.6	62.9′	70

*ACR survey was incomplete.
′NCR survey inadequate (i.e. number of additional species in penultimate or last plot > 5% total no. species).

These results demonstrate the efficiency of the gradsect procedure in sampling for species diversity, and justify the decision to re-survey ACR sites using a systematic sampling procedure to enable comparisons to be made between sites. The comparison also reveals, however, that in many cases a large number of species observed in the ACR were not recorded in the NCR. This partly reflects the fact that 9 of the 15 sites are considered to have been inadequately sampled for purposes of the NCR.

Comparative data from the ACR provide a valuable means of assessing the efficiency with which species diversity is sampled by the NCR. In the case of the six adequately surveyed sites, up to 18.6% (Beraliya Kudagala) of the total number of species for combined reviews were recorded only by the ACR. Thus, it can be concluded that gradsect sampling accounts for no more and probably less than 80% of woody species within a forest.

As the NCR progresses, it should be possible to obtain better estimates of the efficiency of the sampling procedure with respect to woody plants, using the few sites for which comprehensive inventories already exist as standards. Examples of well-inventoried forests include Hakgala, Ritigala, south-western Sinharaja and Udawattakele.

3. SOIL CONSERVATION AND HYDROLOGY ASSESSMENT

3.1 IMPORTANCE OF FORESTS FOR SOIL CONSERVATION

The estimated mean annual soil loss for each of the 45 forests under standard conditions (defined in Part B, Section 2.2.2) is given in Table 11. Kalubowitiyana has the highest erosion hazard due mainly to its high rainfall and steep slopes. The predicted proneness of this forest to erosion was borne out during a field visit when a landslide was observed. By contrast, Bundala ranks as the penultimate site. Despite its soils being much more erodible than any other forest, its rainfall and slope values are extremely low.

In general, forests in the wet zone are much more prone to erosion than those in the dry zone on account of much higher rainfall and steeper terrain. Exceptions are forests such as Badullakele, Dandeniya-Aparekka and Kekanadura, which lie within low rainfall isohyets in the coastal lowlands.

The acceptable level of soil erosion in Sri Lanka is about 9 t ha^{-1} yr^{-1} (Krishnarajah, 1984). All forests in Hambantota in the dry zone are at or below this threshold with the exception of Wedasitikanda, a reflection of its steep terrain.

3.2 HYDROLOGICAL IMPORTANCE OF FORESTS

3.2.1 Protection of headwaters of river systems

This part of the hydrological assessment is based on the number of streams and catchments, and the total distance to the outlets of rivers. Values for each forest are given in Table 12.

Diyadawa is the most important forest for headwaters protection, a reflection of it encompassing the headwaters of the Gin Ganga and Nilwala Ganga, and the substantial number of streamlets originating from this forest. It was observed during a field visit that a number of government and private organizations obtain water directly from streams originating from this forest, including water for a sprinkler system in a tea plantation. The adjacent forest of Dellawa ranks as the second most important forest.

All forests in Hambantota District rank lowest in priority for headwaters protection. Lying on the district boundary between Hambantota and Matara, Rammalekanda receives a comparatively high rainfall. Forty three streams originate from this forest and sustain two rivers, placing it in sixth place in the rank order. The majority of forests in Hambantota, such as Bundala, Katagamuwa, Madunagala and Miyandagala, have no streams at all, while those having one or two streams, namely Keulakada Wewa and Wedasitikanda, respectively, have no perennial streams. Such streams in the dry zone carry water only during the monsoon season, remaining dry for the rest of the year.

3.2.2 Protection from flooding

The mean annual flood for each forest, estimated from its mean annual rainfall, area and stream frequency, is given in Table 13. Kanneliya should receive the highest priority for conservation with respect to flood hazard, reflecting its larger area, higher stream frequency and higher rainfall than most other forests. Other important forests for flood control include Beraliya (Kudagala), Dediyagala, Dellawa, Diyadawa, Mulatiyana and Nakiyadeniya. Habarakada has a particularly high stream frequency and rainfall compared to most other forests, but its mean annual flood is fairly low due to its small size.

Forests with no streams, such as most of those in the dry zone plus Badullukele, Kekanadura and Oliyagankele in the wet zone, are of negligible importance in preventing floods. In contrast, the majority of forests in the wet zone have a significant role in flood control.

Table 11 Importance of natural forests in Southern Province for controlling soil erosion (Source: Gunawardena, 1993)

No.	Forest name	Rainfall mm yr^{-1}	Erosivity J m^{-2} yr^{-1}	Slope m m^{-1}	Erodibility	Erosion t ha^{-1} yr^{-1}	Erosion rank
GALLE							
509	Auwegalakanda	4500	45748	0.380	0.22	1794.2	3
511	Bambarawana	4150	42265	0.310	0.22	1103.2	6
37	Beraliya (Akuressa)	2671	27549	0.200	0.22	299.3	25
38	Beraliya (Kudagala)	3660	37390	0.190	0.22	366.6	21
62	Darakulkanda	3457	35370	0.100	0.22	96.1	34
65	Dediyagala	3437	35171	0.190	0.22	344.8	22
69	Dellawa	3759	38375	0.280	0.22	817.1	12
120	Habarakada	4397	44723	0.410	0.22	2041.9	2
508	Hindeinattu	3083	31649	0.340	0.22	993.7	9
507	Homadola	3800	38783	0.220	0.22	509.8	15
173	Kandawattegoda	2550	26345	0.170	0.22	206.8	28
175	Kanneliya	3984	40614	0.190	0.22	398.2	19
208	Kombala-Kottawa	2680	27639	0.120	0.22	108.1	33
253	Malambure	3937	40146	0.280	0.22	854.9	11
303	Nakiyadeniya	3561	36405	0.180	0.22	320.4	24
369	Polgahakanda	4051	41280	0.160	0.22	287.0	26
328	Tawalama	4340	44156	0.200	0.22	479.7	16
506	Tiboruwakota	4350	44255	0.340	0.22	1389.5	4
510	Yakdehikanda	3600	36793	0.320	0.22	1023.3	8
MATARA							
501	Aninkanda	3250	33310	0.350	0.22	1108.3	5
24	Badullakele	2070	21569	0.050	0.22	14.6	39
60	Dandeniya-Aparekke	1839	19271	0.070	0.22	25.6	38
500	Derangala	3500	35798	0.300	0.22	875.1	10
77	Diyadawa	3410	34902	0.330	0.22	1032.3	7
138	Horagala-Paragala	3209	32902	0.210	0.22	394.1	20
497	Kalubowitiyana	4189	42653	0.480	0.22	2669.1	1
190	Kekanadura	1721	18097	0.030	0.22	4.4	41
178	Kanumuldeniya	2432	25171	0.140	0.22	134.0	32
201	Kirinda-Maheyayakele	1940	20276	0.080	0.22	35.2	37
498	Kurulugala	3400	34803	0.210	0.22	416.9	18
263	Masmullekele	2076	21629	0.120	0.22	84.6	35
293	Mulatiyana	3034	31161	0.200	0.22	338.5	23
329	Oliyagankele	2465	25499	0.140	0.22	135.7	31
343	Panilkanda	3133	32146	0.270	0.22	636.5	13
388	Rammalekanda	2837	29201	0.230	0.22	419.6	17
499	Silverkanda	3380	34604	0.260	0.22	635.3	14
453	Viharakele	2444	25291	0.150	0.22	154.6	29
471	Welihena	2723	28067	0.140	0.22	149.4	30
HAMBANTOTA							
44	Bundala	878	9709	0.007	0.48	0.3	44
186	Katagamuwa	1100	11918	0.006	0.27	0.1	45
526	Keulakada Wewa	1300	13908	0.018	0.27	1.5	42
237	Madunagala	1150	12415	0.047	0.27	9.1	40
249	Mahapitakanda	2368	24534	0.080	0.22	42.6	36
525	Miyandagala	1050	11420	0.013	0.27	0.6	43
464	Wedasitikanda	1062	11540	0.270	0.27	280.4	27

Table 12 Importance of natural forests in Southern Province for protection of headwaters of river systems (Source: Gunawardena, 1993)

No.	Forest name	Streams		Catchments		Outlet distance		Sum of ranks	Final rank
		No.	Rank	No.	Rank	No.	Rank		
GALLE									
509	Auwegalakanda	10	19	2	2	149	3	24	9
511	Bambarawana	6	20	1	3	44	26	49	27
37	Beraliya (Akuressa)	37	9	2	2	64	18	29	14
38	Beraliya (Kudagala)	43	7	2	2	71	16	25	10
62	Darakulkanda	4	22	1	3	33	29	54	31
65	Dediyagala	111	2	2	2	102	11	15	5
69	Dellawa	77	4	2	2	145	4	10	2
120	Habarakada	18	13	1	3	58	21	37	22
508	Hindeinattu	4	22	2	2	69	17	41	24
507	Homadola	15	15	1	3	47	24	42	25
173	Kandawattegoda	4	22	1	3	7	34	59	37
175	Kanneliya	245	1	2	2	109	8	11	3
208	Kombala-Kottawa	17	14	3	1	59	20	35	18
253	Malambure	36	10	1	3	52	23	36	20
303	Nakiyadeniya	46	6	3	1	131	6	13	4
369	Polgahakanda	20	12	2	2	99	12	26	11
428	Tawalama	33	11	2	2	118	7	20	7
506	Tiboruwakota	12	17	2	2	154	2	21	8
510	Yakdehikanda	4	22	1	3	57	22	47	26
MATARA									
501	Aninkanda	4	22	1	3	74	14	39	23
24	Badullakele	0	26	0	4	0	35	65	39
60	Dandeniya-Aparekka	6	20	1	3	22	32	55	33
500	Derangala	1	25	1	3	45	25	53	29
77	Diyadawa	73	5	2	2	158	1	8	1
138	Horagala-Paragala	41	8	1	3	61	19	30	15
497	Kalubowitiyana	5	21	2	2	140	5	28	12
178	Kanumuldeniya	5	21	1	3	30	30	54	30
190	Kekanadura	0	26	0	4	0	35	65	39
201	Kirinda Mahayayakele	4	22	1	3	27	31	56	35
498	Kurulugala	6	20	1	3	99	12	35	19
263	Masmullekele	1	25	1	3	17	33	61	38
293	Mulatiyana	96	3	1	3	52	23	29	13
329	Oliyagankele	0	26	0	4	0	35	65	39
343	Panilkanda	6	20	1	3	77	13	36	21
388	Rammalakanda	43	7	2	2	103	10	19	6
499	Silverkanda	11	18	1	3	108	9	30	16
453	Viharekele	10	19	1	3	33	29	51	28
471	Welihena	3	23	1	3	34	28	54	32
HAMBANTOTA									
44	Bundala	0	26	0	4	0	35	65	39
186	Katagamuwa	0	26	0	4	0	35	65	39
526	Keulakada Wewa	1	25	1	3	41	27	55	34
237	Madunagala	0	26	0	4	0	35	65	39
249	Mahapitakanda	13	16	2	2	72	15	33	17
525	Miyandagala	0	26	0	4	0	35	65	39
464	Wedasitikanda	2	24	1	3	30	30	57	36

Table 13 Importance of natural forests in Southern Province for flood control (Source: Gunawardena, 1993)

No.	Forest Name	Rainfall mm yr^{-1}	Area km^2	Stream freq. streams km^{-2}	Mean flood $m^3 s^{-1}$	Flood rank
GALLE						
509	Auwegalakanda	4500	2.50	3.20	13.91	18
511	Bambarawana	4150	2.48	2.82	11.62	21
37	Beraliya (Akuressa)	2671	16.46	1.80	25.11	12
38	Beraliya (Kudagala)	3660	25.72	1.48	50.42	6
62	Darakulkanda	3457	1.42	2.11	4.91	31
65	Dediyagala	3437	37.90	2.70	87.22	2
69	Dellawa	3759	22.36	2.90	65.47	3
120	Habarakada	4397	2.10	8.10	18.70	16
508	Hindeinattu	3083	2.00	2.00	5.47	28
507	Homadola	3800	3.00	3.67	13.86	19
173	Kandawattegoda	2550	3.59	1.11	5.13	30
175	Kanneliya	3984	60.25	3.77	186.05	1
208	Kombala-Kottawa	2680	16.25	1.11	19.50	15
253	Malambure	3937	9.30	3.12	34.61	10
303	Nakiyadeniya	3561	22.36	1.74	46.93	7
369	Polgahakanda	4051	5.77	3.12	24.08	13
328	Tawalama	4340	10.00	3.20	42.46	8
506	Tiboruwakota	4350	6.00	1.83	20.85	14
510	Yakdehikanda	3600	1.00	3.00	4.62	32
MATARA						
501	Aninkanda	3250	2.23	1.79	6.08	27
24	Badullakele	2070	1.48	0.00	0.00	39
60	Dandeniya-Aparekke	1839	3.48	1.07	3.17	33
500	Derangala	3500	0.75	1.33	2.31	35
77	Diyadawa	3410	24.48	2.52	57.72	4
138	Horagala-Paragala	3209	18.12	2.15	38.11	9
497	Kalubowitiyana	4189	2.72	1.84	10.23	22
178	Kanumuldeniya	2432	6.79	0.64	6.21	26
190	Kekanadura	1721	3.80	0.00	0.00	39
201	Kirinda-Mahayayakele	1940	2.53	0.91	2.40	34
498	Kurulugala	3400	2.85	2.11	8.62	24
263	Masmullekele	2076	6.18	0.14	2.14	36
293	Mulatiyana	3034	31.49	2.25	57.55	5
329	Oliyagankele	2465	4.86	0.00	0.00	39
343	Panilkanda	3133	5.88	1.58	12.25	20
388	Rammalekanda	2837	14.07	2.22	26.55	11
499	Silverkanda	3380	7.25	1.52	15.86	17
453	Viharakele	2444	6.25	0.94	7.10	25
471	Welihena	2723	2.97	1.36	5.30	29
HAMBANTOTA						
44	Bundala	878	62.16	0.00	0.00	39
186	Katagamuwa	1100	10.04	0.00	0.00	39
526	Keulakada Wewa	1300	3.00	0.33	0.96	38
237	Madunagala	1150	9.75	0.00	0.00	39
249	Mahapitakanda	2368	7.22	1.52	9.81	23
525	Miyandagala	1050	3.00	0.00	0.00	39
464	Wedasitikanda	1062	13.43	0.15	1.73	37

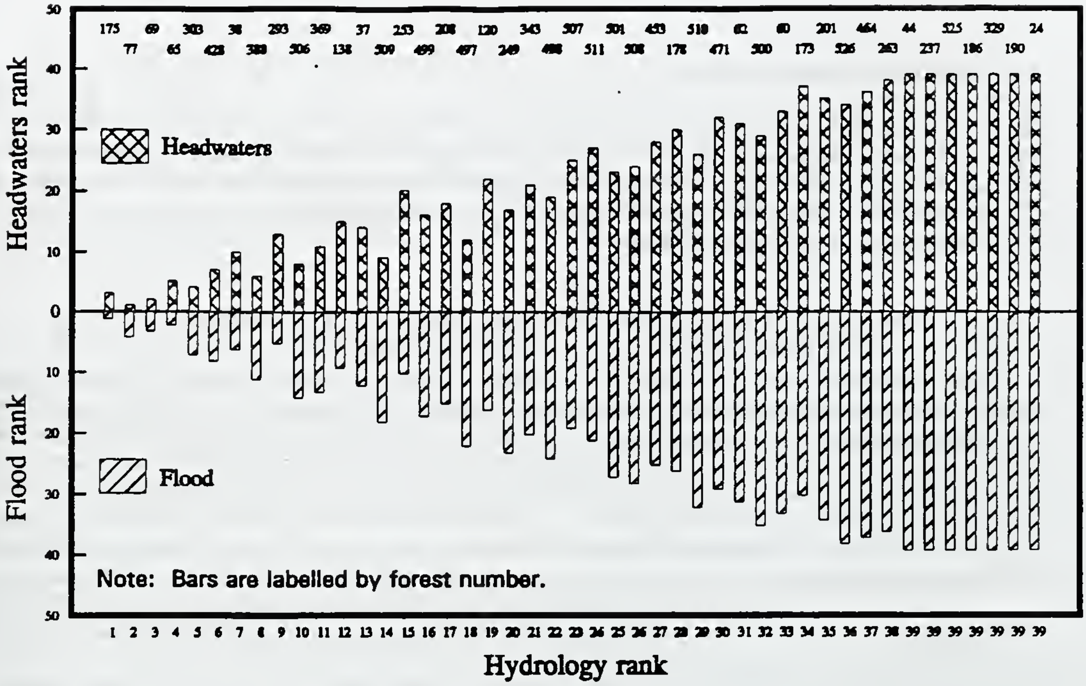


Figure 5 Hydrological importance of natural forests, showing the relationship between headwaters protection and flood hazard

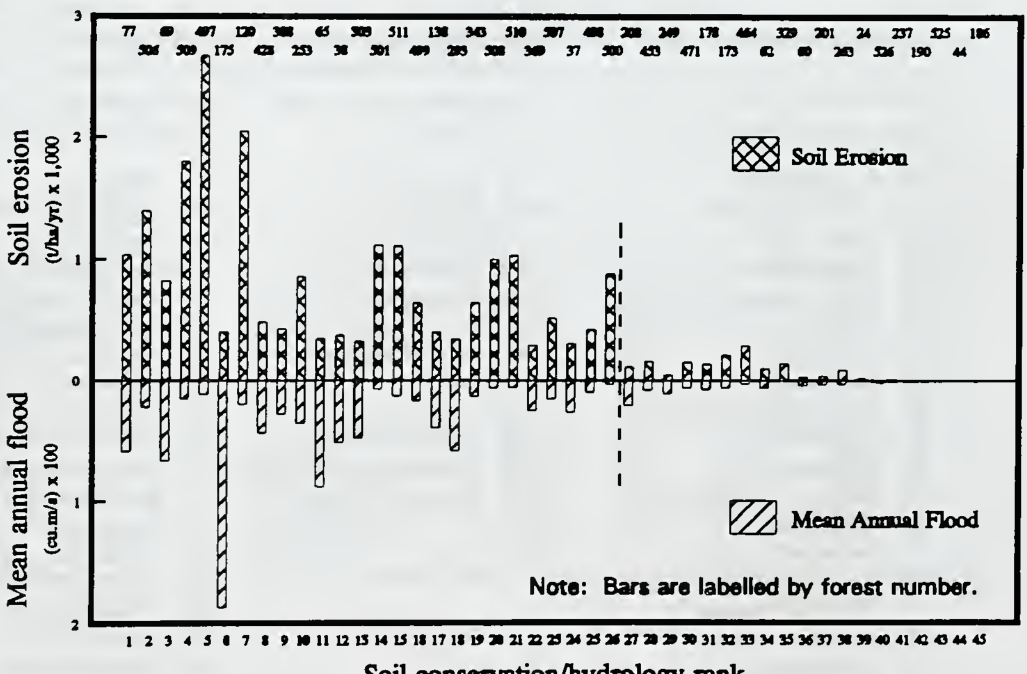


Figure 6 Relationships between soil erosion, flood hazard and overall importance for soil conservation and hydrology

3.2.3 Hydrological importance

Assessment of the overall hydrological importance of forests is based on ranking the combined values of the ranks for headwaters importance and flood control. Figure 5 shows the relationship between hydrological importance and the two criteria (headwaters importance and flood hazard) used to assess it. The very good symmetry about the x axis clearly demonstrates that headwaters importance and flood hazard are complementary as indicators of hydrological importance.

3.3 IMPORTANCE OF FORESTS FOR SOIL CONSERVATION AND HYDROLOGY

Evaluation of the overall importance of forests for soil conservation and hydrology is based on ranking the combined values of the ranks for erosion hazard and hydrological importance. Since flood hazard provides an adequate measure of hydrological importance, given its close relationship with headwaters importance (see Section 3.2.3), it can be examined in relation to soil erosion in order to identify criteria, based on absolute values, to classify forests according to their importance for soil conservation and hydrology.

Figure 6 shows the relationships between soil erosion, flood hazard and the ranked importance for soil conservation/hydrology. The position of the dotted lined marks the division between forests considered to be important for soil conservation and/or hydrology to the left, with an erosion hazard >300 t ha^{-1} yr^{-1} **and/or** a flood hazard >10 m^3 s^{-1}, and those estimated to be less important to the right, with an erosion hazard <300 t ha^{-1} yr^{-1} and a flood hazard <10 m^3 s^{-1}.

Table 14 Importance of natural forests in Southern Province for soil conservation and hydrology. Districts are in brackets. (Source: Gunawardena, 1993)

VERY IMPORTANT	MAY BE IMPORTANT	LESS IMPORTANT
Soil Erosion (>300 t ha^{-1} yr^{-1}) Mean Annual Flood (>10 m^3 s^{-1})	**For Erosion Hazard only (>300 t ha^{-1} yr^{-1})**	**Soil Erosion (<300 t ha^{-1} yr^{-1}) Mean Annual Flood (<10 m^3 s^{-1})**
77 Diyadawa (M)	501 Aninkanda (M)	453 Viharekele (M)
506 Tiboruwakota (G)	508 Hindeinattu (G)	249 Mahapitakanda (H)
69 Dellawa (G)	510 Yakdehikanda (G)	471 Welihena (M)
509 Auwegalakanda (G)	498 Kurulugala (M)	178 Kanumuldeniya (M)
497 Kalubowitiyana (M)	500 Derangala (M)	173 Kandawattegoda (G)
175 Kanneliya (G)		464 Wedasitikanda (H)
120 Habarakada (G)	**For Flood Hazard only**	62 Darakulkanda (G)
428 Tawalama (G)	**(>10 m^3 s^{-1})**	329 Oliyagankele (M)
388 Rammalakanda (M)		60 Dandeniya-Aparekka (M)
253 Malambure (G)	369 Polgahakanda (G)	201 Kirinda Mahayayakele (M)
65 Dediyagala (G)	37 Beraliya (Akuressa) (G)	263 Masmullekele (M)
38 Beraliya (Kudagala) (G)	208 Kombala-Kottawa (G)	24 Badullakele (M)
303 Nakiyadeniya (G)		526 Keulakada Wewa (H)
511 Bambarawana (G)		237 Madunagala (H)
499 Silverkanda (M)		190 Kekanadura (M)
138 Horagala-Paragala (M)		525 Miyandagala (H)
293 Mulatiyana (M)		44 Bundala (H)
343 Panilkanda (M)		186 Katagamuwa (H)
507 Homadola (G)		

Forests are classified according to these criteria in Table 14. Those 19 forests considered to be very important for controlling soil erosion and flooding warrant high priority as conservation areas. All of them lie in the wet zone and they include a number of large, other state forests or proposed reserves, which have minimal legal protection status. Examples are Beraliya (Kudagala), Dellawa, Horagala-Paragala, Nakiyadeniya, Silverkanda and Tawalama, all of which are at least 1,000 ha in area. Less important for soil conservation and hydrology are all those forests lying in the dry zone, together with some in the coastal lowlands of the wet zone. The latter tend to lie within low rainfall isohyets and/or lack streams, such as Badullukele, Dandeniya-Aparekka, Kekanadura and Oliyagankele.

3.4 SOIL CONSERVATION/HYDROLOGY AND BIOLOGICAL DIVERSITY

In order to examine relationships between soil conservation/hydrology and biological diversity, is first necessary to treat individual forests as part of larger complexes by combining data on soil erosion and hydrology in the same way as done for the biological diversity study (see Section 2.3). It should be noted, however, that the present analysis is restricted to 15 forest complexes, these being common to both the soil conservation/hydrology and biological diversity studies. Not included are Sinharaja *et al.*, Ruhuna NP and Bundala/Mangroves because they have yet to be assessed with respect to their soil conservation and hydrological values. It can be assumed, however, that these three complexes will need to be part of any optimal conservation areas network in view of their great importance for biological diversity (see Section 2.3).

Combined soil conservation/hydrology data for each forest complex are given in Table 15. There is an extremely close agreement between these results and those of the biological diversity survey (Table 4a). Both soil erosion and flood hazard are closely related to biological diversity, as shown in Figures 7a and 7b, respectively. KDN *et al.* [175] is outstandingly important for biological diversity and for control of soil erosion and flooding[4], followed by Dellawa/Diyadawa/Kalubowitiyana [69] and Horagala-

Table 15 Importance of forest complexes in Southern Province for soil erosion control, headwaters protection and flood control. Forest complexes are ranked in descending order for their overall importance for soil conservation and hydrology.

No.	Subsidiary nos	Name	Area ha	Erosion t $ha^{-1}yr^{-1}$	Headwaters Stream no.	Headwaters Catch. no.	Headwaters Dist. km	Flood m^3s^{-1}	Rank
175	65,303,500,505,507,508	KDN et al.	13546.4	390	455	3	621	384	1
69	77,497	Della/Diya/Kalu	4712.2	1025	155	2	443	133	2
138	293,388	Hora-Para/Mula/Ram	6775.6	372	180	2	216	122	3
120	129,509,511	Haba/Hay/Auw/Bamb	1069.6	1626	34	3	251	44	4
253	369	Malam/Polga	1874.6	638	56	4	151	59	5
38	62	Berel/Daru	4698.7	353	47	2	104	55	6
343	501	Panil/Anin	663.1	766	10	1	151	86	7
37		Beraliya (Akuressa)	1859.9	299	37	2	64	25	8
173	208	Kanda/Komb-Kott	2694.4	126	21	3	66	15	9
178	453	Kanu/Vihi	1503.8	144	15	2	63	13	10
186	187,464	Kata/Kata/Weda	3184.7	161	2	1	30	2	11
329	471	Oliy/Weli	821.7	141	3	1	34	5	12
60	190,201	Dand/Keka/Kiri	1335.8	20	10	1	49	6	13
24	263	Badu/Masmu	987.7	71	2	1	17	2	14
237	525	Madu/Miya	1275.2	6	1	1	41	1	15

[4]Only flood hazard is considered here as a measure of hydrological importance, the other indicator being headwaters protection to which flood hazard is closely related (see Section 3.2.3).

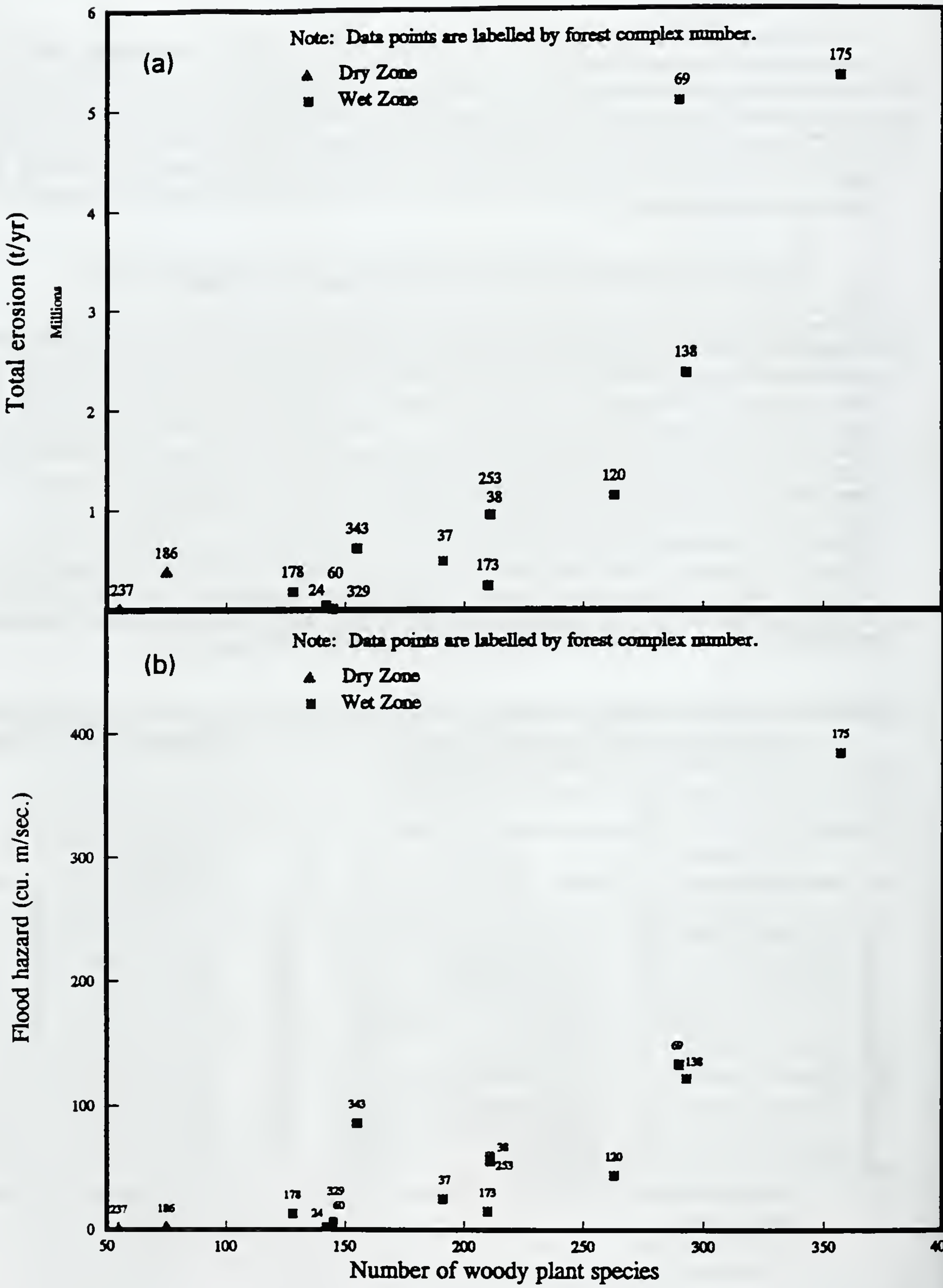


Figure 7 Relationship between (a) total soil erosion and woody plant diversity, and between (b) flood hazard and woody plant diversity

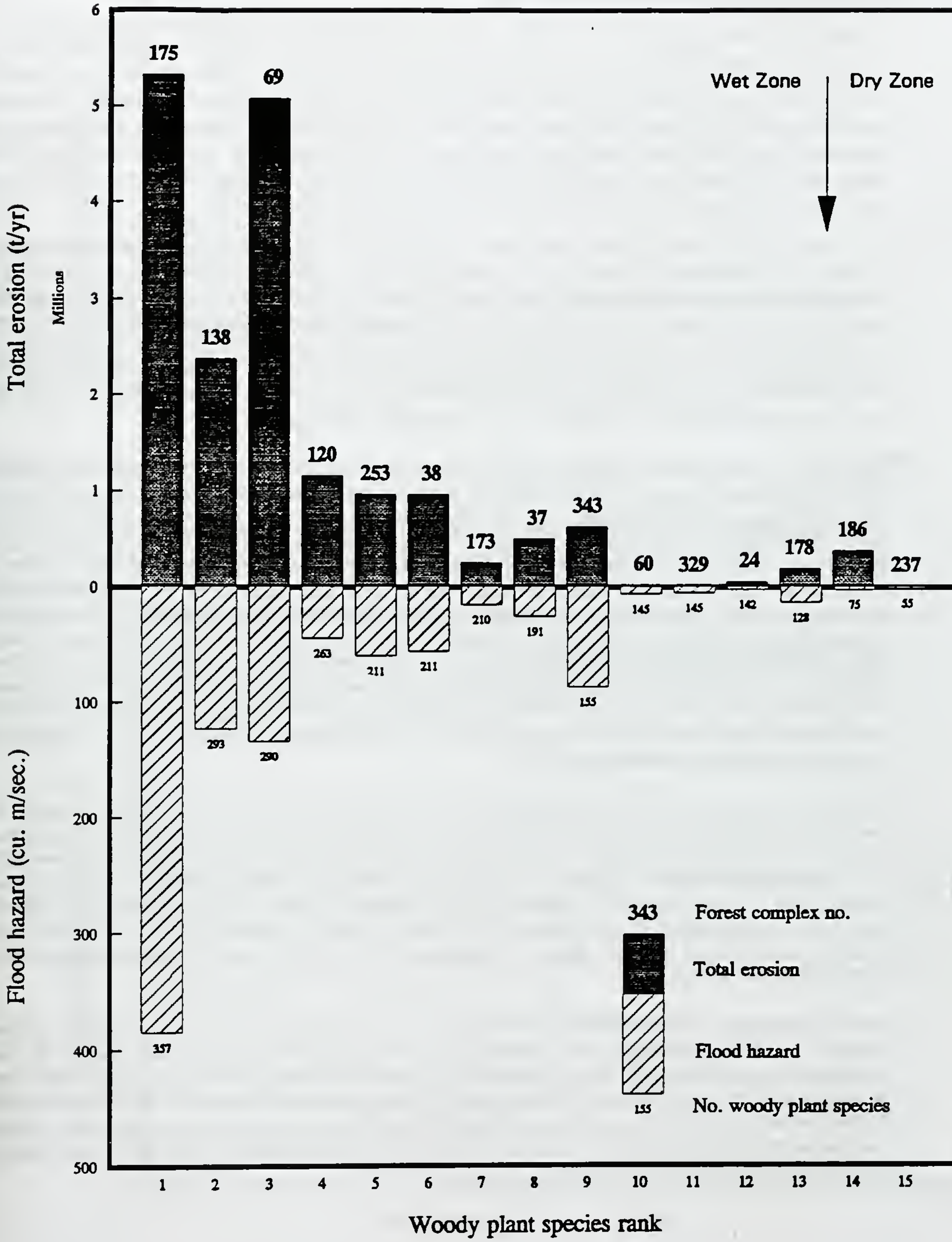


Figure 8 Relationships between total soil erosion, flood hazard and woody plant diversity

Paragala/Mulatiyana/Rammalakanda [138]. The close relationship between erosion or flood hazard and biological diversity is likely to reflect rainfall and terrain. Species richness is correlated with rainfall and altitudinal range. Thus, forests with steep terrain and high rainfall support a greater wealth of species and are more prone to erosion and/or flooding than forests with a fairly uniform terrain and little rainfall. It should be possible, therefore, to predict biological diversity from importance for soil conservation and hydrology, the advantage being that the latter assessment is much more rapid than the former. Such predictions have limited value, however, because they are concerned only with total diversity. Species distribution patterns are not predicted, preventing minimum conservation areas networks from being defined.

The relative importance of a complex with respect to soil erosion, flood hazard and biological diversity is shown in Figure 8. Flood hazard is plotted on the -y axis to facilitate comparison with total erosion (y axis). Thus, Dellawa/Diyadawa/Kalubowitiyana [69] is second in importance to KDN *et al.* [175] for both erosion and flood control, but it is marginally less diverse than Horagala-Paragala/Mulatiyana/Rammalakanda [138] which ranks third in importance for erosion and flood control. Complexes with a low diversity (< 150 woody species) tend to be of negligible importance for erosion and flood control, the exception being Kanumuldeniya/Viharekele [178] for flood control. Katagamuwa/Kataragama/Wedasitikanda [186] has a higher total erosion than other low diversity complexes but it is below the critical threshold of 300 t ha^{-1} yr^{-1}.

There is also a close relationship between the rank orders of forest complexes for soil conservation/hydrology and biological diversity with respect to both woody species (Figure 9a) and endemic woody species (Figure 9b). The dotted lines mark the positions of the soil erosion and flood criteria used to classifiy forests into three categories of importance (see Section 3.3). Thus, complexes below both dotted lines are classified as being very important for soil conservation and hydrology, those lying between the lines may be important for either soil erosion or flood control, and those above both lines are less important. Superimposed on these figures are the minimum networks of complexes (solid symbols) required to represent all woody species (Figure 9a) and all endemic woody species (Figure 9b). Thus, a network representative of all woody species in Southern Province and including all complexes important for soil conservation and hydrology would comprise 14 of the 15 complexes, the only redundant complex (open symbol) being Badullakele/Masmullekele [24] which is among the least diverse sites and of negligible value in controlling soil erosion and flooding. Redundant in terms of the biological diversity assessment, but possibly important for flood control are Kanumuldeniya/Viharekele [178] and Kandawattegoda/Kombala-Kottawa [173].

Similarly, a minimum network of 13 complexes can be defined to include those important for soil conservation and hydrology, and to be representative of all endemic woody species. Complexes redundant with respect to biological diversity and of negligible value for soil conservation and hydrology are Badullakele/Masmullekele [24] and Madunagala/Miyandagala [237]. The three complexes of possible value for flood control (Beraliya Akuressa [37], Kanumuldeniya/Viharekele [178] and Kandawattegoda/Kombala-Kottawa [173]) are also redundant in terms of their biological diversity. Although Dellawa/Diyadawa/Kalubowitiyana [69] does not contribute any additional endemic species to the network, it is one of the most important complexes for soil erosion and flood control.

Further optimisation of these networks is necessary in order to ensure adequate representation of faunal diversity[3]. All 15 complexes are necessary for 100% representation of animal species, including Badullakele/Masmullekele [24], which is redundant with respect to woody species and of negligible value in controlling soil erosion and flooding. The network of 13 complexes identified above for endemic woody species requires no further modification with respect to endemic fauna because neither of the two redundant complexes, Badullakele/Masmullekele [24] and Madunagala/Miyandagala [237], contain any additional endemic fauna not already represented in the network (see Table 9b).

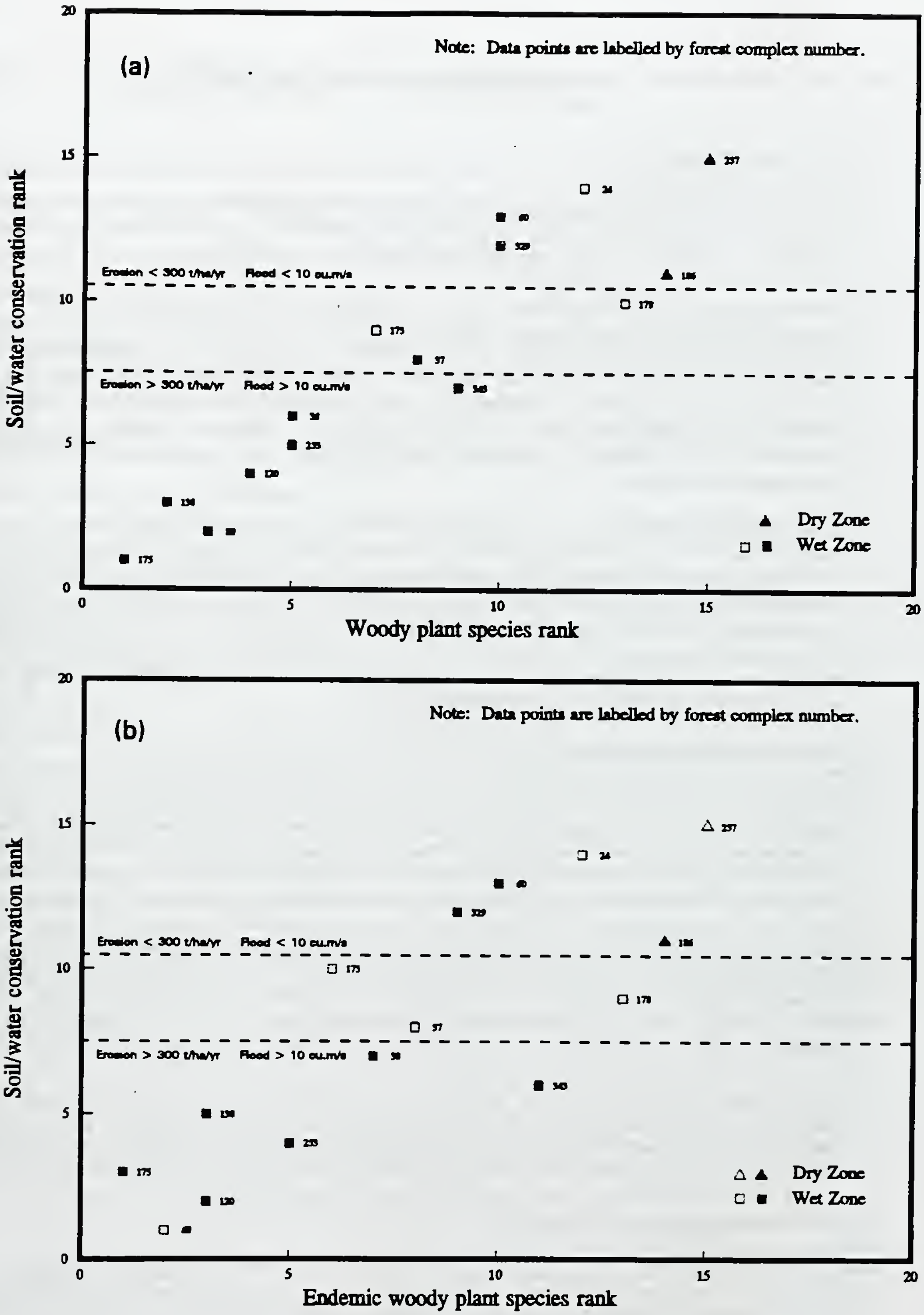


Figure 9 Relationship between rank orders of forest complexes for soil conservation/hydrology and biological diversity with respect to (a) woody plants and (b) endemic woody plants. A solid symbol indicates that the complex is part of a minimum network for woody species; complexes redundant for woody species are denoted by an open symbol.

4. DISCUSSION AND CONCLUSIONS

4.1 DISCUSSION

The NCR is the first ever comprehensive and systematic evaluation of the importance of Sri Lanka's natural forests for biological diversity, soil conservation and hydrology. It is also a unique project, unparalleled elsewhere in the tropics, and may provide a useful model for possible application in other tropical countries.

Considerable progress has already been achieved, with about 10% of the country surveyed to date. Quite apart from the institutional aspects, immediate technical benefits are already apparent in the detailed knowledge of species' distributions obtained from the thousands of records of plants and animals collected in the field. Many species, including endemics and rarities, have been recorded in new localities, and several species new to science have been discovered. Systematically inventorying plants and animals within individual forests, combined with estimating the role of forests in controlling soil erosion and flooding and in protecting the headwaters of river systems, is providing a sound information base for informed decisions to be made concerning their future use.

While the immediate application of this information is to design an optimal national network of conservation areas with respect to natural forests, in the longer term it represents an extremely powerful tool for evaluating the potential impact of proposed development projects on forests, for monitoring changes in the composition of flora and fauna and for management planning, particularly with respect to zonation, including buffer zone development. The ultimate value of having undertaken a nationwide survey will be realised when the impact of any proposed development can be assessed in terms of which species are likely to be threatened or disappear, and how much soil erosion and flooding can be expected to occur as a result. Only then can the real costs of such developments be balanced against the benefits.

4.1.1 Costs of optimal networks

The various conservation options and their associated costs in terms of land requirements are summarised in Table 16. This preliminary analysis shows that all 18 forest complexes, representing 12.3% of the total area of Southern Province, should be protected if maximum conservation criteria are to be applied (Option 8), namely 100% representation of woody plant species and certain groups of animal species, and protection of all forests that are important or may be important for soil conservation and hydrology. Even within this network, only 73% of woody species, or 82% of endemic woody species, would be represented in at least two complexes (Table 8). Representation of species in two or more sites may be an unrealistic goal, however, given the very localised distributions of some species, compounded by the way in which remaining natural forests have become increasingly fragmented and isolated. It should also be noted that no forest within any complex is superfluous (Table 7). Each forest is uniquely important, contributing species not found in other forests of the same complex.

Of the various other options, all of which are less costly in terms of the amount of land required for conservation, Option 9 should be considered as a minimum policy in order to safeguard all endemic species of plants and animals, as well as protect complexes important for soil conservation and hydrology (Table 16). Any network comprising fewer than these 16 complexes could jeopardise the future security of some species endemic to Sri Lanka. Such a network is only marginally smaller than that representative of all species, and comprises 11.9% of the total area of the Province.

Optimal networks of forest complexes defined by Options 8 and 9 are shown in Figures 10 and 11 for 100% representation of species and endemic species, respectively. The importance of each forest for woody plants, animals, and soil conservation and hydrology is shown as a series of overlays using a geographic information system. Unfortunately, the maps cover only cover Galle and Matara districts because forest cover is still in the process of being digitised at 1:50,000. Forest cover data were provided by courtesy of the Forest and Land Use Mapping Project, a Government of Sri Lanka/UK Overseas Development Adminstration venture.

Table 16 Minimum networks of forest complexes required for conservation, based on various criteria with respect to biological diversity and soil conservation/hydrology

Criteria	Minimum network of complexes		Redundant complexes
	No.′	Area (% prov.)*	
Woody plants------------------------------			
1. Species	15	63,798 (11.6%)	[24], [173], [178]
2. Endemic species	12	56,093 (10.2%)	[24], [37], [69], [173], [178], [237]
Woody plants + Animals ---------------			
3. Species	17	66,547 (12.1%)	[178]
4. Endemic species	15	64,206 (11.7%)	[24], [178], [237]
---------------------------------- **Soil/Water**			
5.	12	60,562 (11.0%)	[24], [44], [60], [186], [237], [329]
Woody plants + ------------- **Soil/Water**			
6. Species	17	67,085 (12.2%)	[24]
7. Endemic species	16	65,510 (11.9%)	[24], [237]
Woody plants + Animals + Soil/Water			
8. Species	18	67,851 (12.3%)	none
9. Endemic species	16	65,510 (11.9%)	[24], [237]

′ Where appropriate, minimum networks include Bund/Mangroves [44], Ruhuna NP [398] and Sinharaja et al. [414], none of which has yet been assessed for soil conservation/hydrology, on the basis that [398] and [414] are of importance and [44] is of negligible value for soil conservation and hydrology.

* Area of Southern Province is 69,645 ha (Galle = 160,733 ha, Matara = 129,931 ha, Hambantota = 259,432 ha). The adjacent forests of Haycock (362 ha), Kataragama (838 ha), Ruhuna Blocks 2-4 (77,124 ha) and approximately two-thirds of Sinharaja (7,383 ha), which lie outside the Province, are excluded from the total area of the network in order to calculate its percentage of the Province.

These networks, like others defined in Table 16, are conservative and will need to be reviewed within the national context once the NCR is completed. The distributions of many species are not confined to Southern Province and, therefore, a network representative of 100% of the Province's biological diversity is likely to comprise fewer complexes as more species are recorded in forests outside the Province. There is an absolute minimum requirement of 8-12 complexes, however, if soil conservation and hydrological criteria are to be met. Seven complexes are estimated to be very important for soil erosion and flood control, and an additional three complexes are important for one or other of these parameters (Figure 9a). To this total should be added Sinharaja *et al.* and Ruhuna NP, both of which have yet to be assessed. They are likely to meet the criteria for classification as *very important* and *may be important* complexes, respectively, but not Bundala/Mangroves which is of negligible importance for soil erosion and flood control (see Table 14 for Bundala).

The eight complexes vitally important for soil erosion and flood control are almost without exception the most diverse sites for woody species (see Table 4a). They include **Sinharaja** [414], a World Heritage site, and **KDN** [175] which is the second largest remaining rain forest after Sinharaja[5]. KDN is considered to be the most important lowland rain forest in the country, its rocky terrain and acid soils being of special importance for many endemics. Despite having been logged and degraded, its diversity is extremely high and it is possible that

---

[5]Sinharaja National Heritage Wilderness Area (11,187 ha), itself, is smaller than KDN (present total area = 12,050 ha) but it lies within a much larger block of forest that includes other reserves such as Dellawa PR (2,236 ha) and Diyadawa FR (2,448 ha).

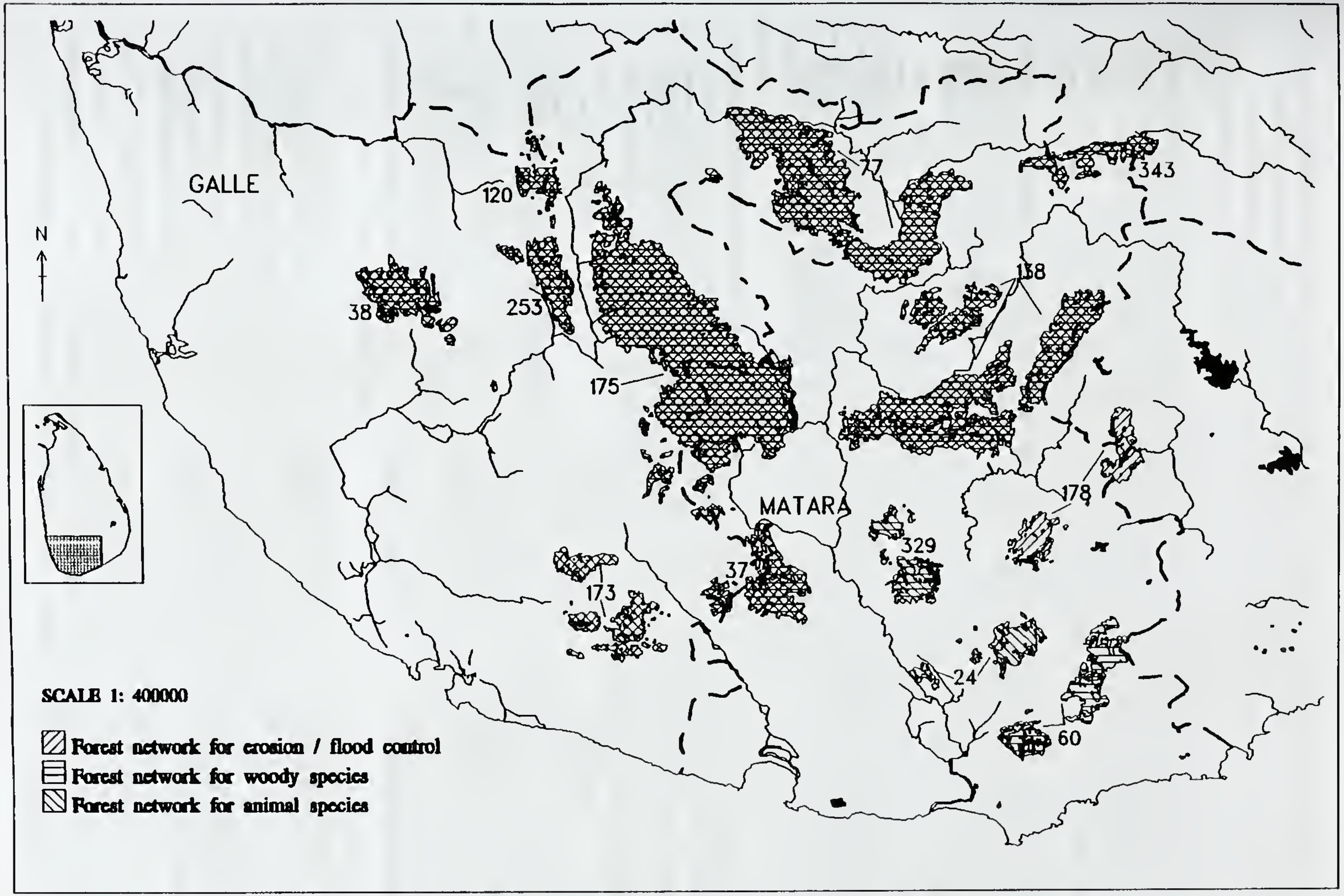


Figure 10 Optimal network of closed canopy natural forests in Galle and Matara districts, with 100% representation of species of woody plants and animals (selected groups) and including forests vital for soil conservation and hydrology [Erratum: The forest complex label 77 should read 69.]

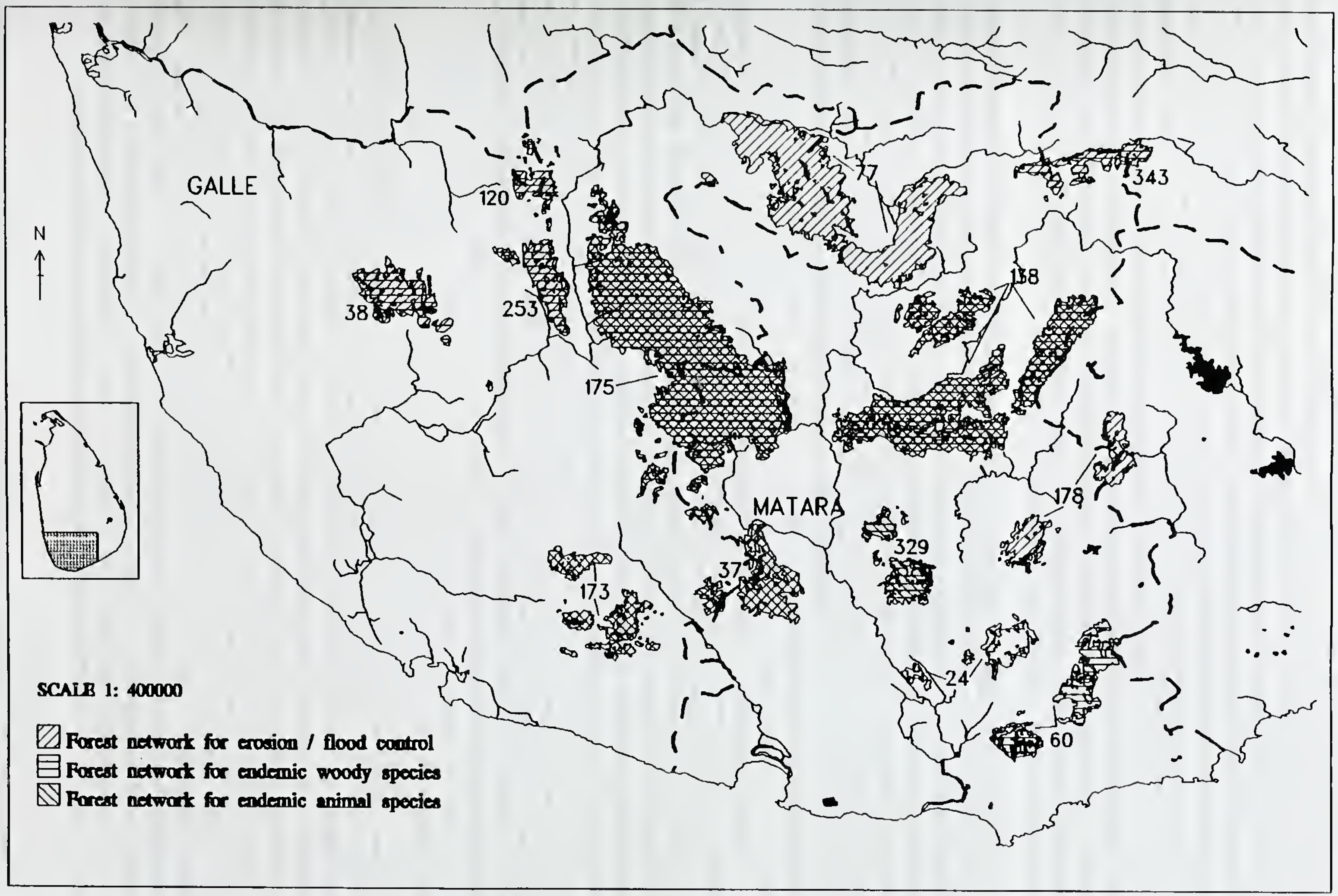


Figure 11 Optimal network of closed canopy natural forests in Galle and Matara districts, with 100% representation of endemic species of woody plants and animals (selected groups) and including forests vital for soil conservation and hydrology [**Erratum:** The forest complex label 77 should read 69.]

little may yet have been lost. This would be unlikely to remain the case if further logging took place, and it is thought that the forest will take a long time to recover from past logging, even with strict protection (P.S. Ashton, *in litt.*, 1992). Immediately to the north-west of KDN is another important complex [120] of isolated hills including Hinidunkanda, which lies in Habarakada and is the highest hill in Southern Province. Some extremely rare woody species have been recorded from this site, as well as Auwegalakanda and Bambarawana (see Annex 3). **Dellawa and Diyadawa** [69] are relatively large, contiguous tracts of fine rain forest. Not only do they rank as the two most important forests in the Province for protection of headwaters (see Section 3.2.1), but they represent an important extension to the adjacent Sinharaja, effectively increasing its size by over 40% (4,684 ha). **Rammalakanda**, lying within complex 138 and straddling the border of Matara and Hambantota districts, is an extremely interesting forest with typical wet zone characteristics despite being adjacent to the dry zone. The discovery of several Dipterocarpaceae extends the distribution of this family to Hambantota District. Similarly, the presence of *Ceratophora aspera*, *Calotes leolepis* and *Balanopsis ceylonensis* represents the easternmost boundaries of these strictly wet zone species of reptile. Further preliminary details on the biological importance of these and other forests are documented by Jayasuriya *et al.* (1992, 1993).

The scientifically proven need to conserve most, if not all, remaining natural forests in Southern Province, subject to further review on completion of the NCR, precludes them from being converted to other forms of land use. But it does not prevent them from being sustainably used provided that control measures are adequate and properly enforced. It is possible to integrate conservation and socio-economic requirements through appropriate planning and management. Zonation is a major tool whereby conservation areas can be divided into areas having different management objectives and regimes. In the knowledge that a particular forest is important for certain rare endemics, for example, provisions for their conservation can be made by establishing core zones for their strict protection, while at the same time creating other resource use zones in which forest products may be sustainably harvested.

Given the overriding conservation importance of most natural forests in Southern Province, their legal protection status needs to be reviewed and in many cases upgraded. Of the 52 forests evaluated in this study, 1 (Sinharaja) is a national heritage wilderness area, 20 are forest reserves, 8 proposed reserves, 15 other state forests, 4 sanctuaries and 4 (Ruhuna Blocks 1-4) are national parks. The National Heritage Wilderness Areas Act, 1988 and Fauna & Flora Protection Ordinance, 1937 (amended 1970) provide for the protection of habitat and wildlife in national heritage wilderness areas and in sanctuaries[6] and national parks, respectively. While the Forest Ordinance, 1907 (amended 1966) provides for the protection of forests and their products within forest reserves, its primary function has always been to provide for controlled exploitation of timber. Proposed reserves are essentially other state forests earmarked for notification and managed as *de facto* forest reserves. Clearly, the legal status of the vast majority of these remaining forests is inadequate for conservation purposes and will need to be reassessed in the light of impending changes to the Forest Ordinance. Such changes include proper provisions for forests as conservation areas.

4.1.2 Constraints

While every attempt has been made to develop rigorous procedures for evaluating the conservation importance of natural forests and accommodate shortcomings, such as inadequate sampling of the fauna, there remains a major constraint. The biological diversity assessment is aimed at inventorying all woody plant species within each forest but, in practice, possibly only up to 80% of the woody flora is sampled (see Section 2.6). This does not invalidate comparisons made between forests and forest complexes because sites are sampled at approximately the same levels of intensity. However, it does mean that minimum conservation area networks defined on the basis of woody species' distributions may not be representative of certain unrecorded species. Such networks may also be larger than the minimum required because species thought to be unique to a particular forest may be present, though unrecorded, in other sites selected as part of the network. This emphasises the importance of carrying out more detailed surveys of individual forests as part of the management planning process, particularly those of lower biological value that are likely to be assigned to a multiplicity of uses. The importance of additional species recorded as a result of such surveys can then be evaluated with respect to their known distributions and representation elsewhere in the conservation areas network.

---

[6] In sanctuaries the habitat is totally protected on state land but traditional human activities may continue to be practised on private land.

4.2 CONCLUSIONS

The NCR is the first ever systematic evaluation of Sri Lanka's natural forests for biological diversity and for control of soil erosion and flooding, based on comprehensive field surveys. It is a unique project, unparalleled elsewhere in the tropics, and may have useful applications elsewhere. While its immediate value is to enable an optimal network of conservation areas to be defined with respect to natural forests, in the longer term the information generated by the review provides an extremely powerful tool for evaluating the impact of proposed development projects, for monitoring changes in the biota and for management planning.

All forests of 50 ha and larger within Southern Province, representing 10% of the country, have been surveyed to date. Many species of plants and animals, including endemics and rarities, have been recorded in new localities and a few species new to science have been discovered. The results of this survey are preliminary because the importance of forests cannot be evaluated within a national context until such time as the NCR is completed.

Analysis of species' distribution patterns and climatic and topographic variables, such as rainfall, slope, soil type and stream frequency, shows that virtually all remaining forests in the Province are of considerable importance for biological diversity, as well as for control of soil erosion and flooding and for protection of headwaters of river systems. In order to represent all endemic species and include forests important for soil conservation and hydrology, a network of 16 forest complexes would need to be conserved. This represents 11.9% of the total area of the Province. All 18 forest complexes, covering 12.3% of the Province, would be required for representation of all species. This reflects the very localised distributions of some species, with the result that each complex is uniquely important, contributing to the network one or more species not found within other complexes. The networks defined from the results of this study, however, are conservative: less extensive networks may be identified once the NCR is completed and species' distribution patterns are fully determined.

In general, the larger the size of a forest, the higher its diversity of species. This finding emphasises the principle that conservation areas should be as large as possible to maximise representation of species (as well as viability of populations). An outstanding case is Dellawa and Diyadawa, both extremely diverse forests important for watershed protection and adjacent to Sinharaja. Their designation as conservation areas would effectively increase the size of Sinharaja, thereby enhancing its biological value. It is vital, however, that small forests are not overlooked when defining conservation area networks because they may be important for rare and endemic species.

In view of the considerable importance of all remaining forests in the Province, their future conservation role must now be addressed. The legal status of many of these forests will need to be upgraded, particularly those currently designated as other state forests (including proposed reserves). Conservation requirements need not preclude sustainable use of forest resources, provided that it is properly managed and controlled. Forests providing a multiplicity of services will need to be zoned, with core zones for strict protection of biologically important biota, resource use zones for harvesting forest products, and buffer zones for absorbing the impact of peripheral human activities.

REFERENCES

Gunawardena, E.R.N. (1993). A report on the importance of natural forests in Galle, Matara and Hambantota districts for soil conservation and hydrology. IUCN/EMD Report No. 15. 19 pp.

Jayasuriya, A.H.M., Karunaratne, G.P.B. and Abayawardena, S.D. (1992). National Conservation Review Interim Progress Report: January - June 1992. IUCN/EMD Report No. 13. 11 pp.

Jayasuriya, A.H.M., Karunaratne, G.P.B. and Abayawardena, S.D. (1993). National Conservation Review Interim Progress Report: July - December 1992. IUCN/EMD Report No. 16. 14 pp.

Krishnarajah, P. (1984). Soil erosion and conservation in the upper Mahaweli watershed. Paper presented at the International Workshop on Soil Erosion and its Counter Measures. Chiangmai, Thailand, 11-19 November.

TEAMS (1991). Review of forest management plans for environmental conservation. 2 volumes. Final Report to Forestry Planning Unit, Ministry of Lands, Irrigation and Mahaweli Development. TEAMS, Colombo.

UNDP/FAO (1989). Environmental Management in Forestry Developments. Project Document. Mission Report SRL/89/012. December 1989.

Annex 1

LIST OF WOODY PLANT SPECIES

Endemics are marked by an asterisk. Forests are denoted by their number.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
*Abarema	bigemina	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Abrus	precatorius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Abutilon	asiaticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Abutilon	fruticosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Acacia	caesia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Acacia	eburnea	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Acanthus	ilicifolius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Acronychia	pedunculata	+	+	+	.	+	.	.	+	.	.	.	.	.	+	.	+	.	.	+	.	+	.	+	.	+	.
Actephila	neilgherrensis	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Actinodaphne	albida	+	+	.	.	.	.	.	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	.	+	+
*Actinodaphne	albifrons	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Actinodaphne	candolleana	+	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Actinodaphne	elegans	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Adenia	hondala	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Adenia	wightiana	.	+	.	.	.	.	+	+	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	+	+
*Adenanthera	bicolor	.	.	+	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+
*Adinandra	lasiopetala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Aegiceras	corniculatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aganosma	cymosa	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
*Aglaia	apiocarpa	+	+	+	.	.	.	+	+	+	+	+	.	.	.	+	+	+	.	.	+	+	.	+	.	+	+
Aglaia	congylos	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aglaia	elaeagnoidea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Agrostistachys	cerumica	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+
*Agrostistachys	coriacea	+	+	.	.	+	.	+	+	.	.	+	.	.	.	+	.	.	.	.	+	+	.	.	+	.	.
Agrostistachys	indica	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Aidia	gardneri	.	+	+	.	.	+	.	+	+	.	+	+	.	.	+	+	.	.	.	+	+	.	+	.	+	+
*Alangium	salviifolium	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Albizia	chinensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Albizia	odoratissima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Allophylus	varians	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Allophylus	zeylanicus	.	+	+	.	.	+	+	+	+	.	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Alphonsea	sclerocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Alseodaphne	semecarpifolia	.	+	+	.	.	.	+	+	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+
Alstonia	macrophylla	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Alstonia	scholaris	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Ampelocissus	wightiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anamirta	cocculus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
*Ancistrocladus	hamatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Anisophyllea	cinnamomoides	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Annona	squamosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anodendron	manubriatum	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Antidesma	acidum	.	.	+	.	.	+	+	+	+	+	+	+	.	.	+	.	.	.	.	+	+	.	+	.	+	+
Antidesma	bunius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Apama	siliquosa	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Aphania	bifoliata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Aporosa	cardiosperma	.	+	+	.	.	+	+	+	+	.	+	.	.	+	+	.	.	.	.	.	+	.	+	.	+	+
*Aporosa	lanceolata	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
*Ardisia	gardneri	+	.	+	.	.	.	+	+	+	.	+	.	.	.	+	+	.	.	.	.	+	.	.	+	+	+
*Ardisia	moonii	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+
Ardisia	pauciflora	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Areca	catechu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Argyreia	hirsuta	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Argyreia	thwaitesii	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
Aristolochia	ringens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Artabotrys	zeylanicus	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	.	.	+	.	+	+	+	+
Artocarpus	gomezianus	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Artocarpus	heterophyllus	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Artocarpus	nobilis	.	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Asparagus	falcatus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Atalantia	ceylanica	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.
Atalantia	monophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Avicennia	marina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Axinandra	zeylenica	+	.	.	.	.	.	+	+	.	.	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
Azadirachta	indica	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Azima	tetracantha	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Barringtonia	acutangula	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Barringtonia	racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bauhinia	racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Bauhinia	tomentosa	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Begonia	malabarica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Berrya	cordifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Bhesa	ceylanica	.	+	+	.	.	+	+	+	+	+	+	+	.	+	+	.	.	.	+	+	+	.	+	+	+	+
Blachia	umbellata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Boehmeria	malabarica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bombax	ceiba	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.
Breynia	vitis-idaea	.	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+
*Bridelia	moonii	.	+	+	.	.	+	+	+	+	+	+	+	.	+	+	+	.	.	+	.	.	.	+	+	+	+
Bridelia	retusa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Brucea	javanica	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Bruguiera	gymnorhiza	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bruguiera	sexangula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Byrsophyllum	ellipticum	.	+	.	.	.	.	+	.	+	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Caesalpinia	bonduc	.	.	.	+	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Caesalpinia	crista	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Caesalpinia	hymenocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Calamus	delicatulus	.	+	+	.	.	.	+	.	+	.	+	.	.	+	+	.	.	.	.	.	+	.	+	.	+	.
*Calamus	digitatus	.	+	.	.	.	.	+	+	.	.	.	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Calamus	ovoideus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calamus	pseudo-tenuis	.	+	.	.	.	.	+	+	+	.	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
*Calamus	radiatus	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Calamus	rivalis	+	+	.	.	+	+	+	+	+	+	+	+	.	.	+	+	.	.	+	+	.	.	+	+	+	.
Calamus	thwaitesii	.	.	+	.	.	.	.	+	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	+
*Calamus	zeylanicus	.	+	+	.	.	.	+	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	+	+	+
Callicarpa	tomentosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calophyllum	acidus	.	+	.	.	+	.	.	+	+	+	+	+	.	+	+	.	.	.	.	.	+	.	+	.	+	+
*Calophyllum	bracteatum	.	+	+	.	.	.	+	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Calophyllum	calaba	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calophyllum	cordato-oblongum	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calophyllum	moonii	.	+	+	.	.	.	+	+	+	+	+	.	.	+	+	.	.	.	.	+	+	.	+	.	+	+
Calophyllum	soulattri	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calophyllum	thwaitesii	+	+	.	.	+	+	+	+	+	+	+	.	.	+	+	+	.	.	+	.	+	.	+	+	+	+
Camellia	sinensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Campnosperma	zeylanica	.	+	+	.	.	.	+	+	+	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Canarium	zeylanicum	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
*Canthium	campanulatum	.	.	.	.	.	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Canthium	coromandelicum	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+
*Canthium	dicoccum	.	.	+	.	.	+	+	+	+	.	.	+	.	.	+	.	+	.	+	.	+	.	+	+	+	+
Canthium	puberulum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Canthium	rheedii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	baducca	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	divaricata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	grandis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	moonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Capparis	pedunculosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	sepiaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carallia	brachiata	.	+	+	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.
*Carallia	calycina	.	.	.	.	.	.	+	+	+	.	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
Carissa	spinarum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.
Carmona	microphylla	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
Carmona	retusa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Caryota	urens	+	+	+	.	+	+	+	+	+	+	.	+	.	+	+	.	.	.	+	+	+	.	+	+	+	+
Casearia	elliptica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Casearia	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+
Cassipourea	ceylanica	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+
Cassine	glaucum	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Cassia	auriculata	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Cassia	fistula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Cassia	roxburghii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cassia	siamea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Cassia	tora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Catunaregam	malabarica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Catunaregam	spinosa	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cayratia	trifolia	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Celtis	timorensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Cerbera	odollam	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chaetocarpus	castanocarpus	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
*Chaetocarpus	coriaceus	.	+	+	.	.	+	+	+	.	.	+	+	.	.	+	+	.	.	+	+	+	.	+	+	+	.
Chassalia	ophioxyloides	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Chionanthus	albidiflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.
Chloroxylon	swietenia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Chonemorpha	fragrans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Chrysophyllum	lanceolatum	.	+	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	+
Chukrasia	velutina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
*Cinnamomum	cappuru-coronde	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Cinnamomum	dubium	.	+	+	.	.	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
*Cinnamomum	sinharajensis	.	.	.	.	.	.	+	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
Cinnamomum	verum	+	+	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	+	+	.	.	.	+	.
Cinnamomum	zeylanicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Cissus	acuminata	.	+	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Cissus	heyneana	.	+	+	.	+	+	+	+	+	+	+	+	.	.	+	.	.	.	.	+	+	.	+	+	+	+
Cissus	quadrangularis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
Cissus	trilobata	.	.	+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	+	.	.	.	+	+
Cissus	wightiana	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Clausena	dentata	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Clausena	indica	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+
Cleidion	spiciflorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Cleghornia	acuminata	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
*Cleistanthus	ferrugineus	.	+	+	.	+	.	+	+	.	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Cleistanthus	pallidus	.	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+
Cleistanthus	patulus	.	.	+	.	.	+	+	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
Cleistocalyx	operculataus	+	.	+	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Clerodendrum	infortunatum	.	+	+	.	+	+	.	.	+	+	+	.	+	+	+	.	.	.	+	.	+	.	+	+	+	+
Clerodendrum	inerme	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Clerodendrum	paniculatum	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Clidemia	hirta	.	.	.	.	.	.	.	+	+	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	+	+
Coffea	travancorensis	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.
Coffea	wightiana	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Commiphora	caudata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Connarus	championii	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Connarus	monocarpus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Cordia	dichotoma	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Cordia	gharaf	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cordia	monoica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cordia	oblongifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Coscinium	fenestratum	.	+	+	.	+	+	+	+	+	+	+	+	.	.	+	+	.	.	+	+	+	.	+	+	+	.
*Cotylelobium	scabriusculum	.	.	.	.	.	.	+	.	.	.	+	.	.	+	+	+	.	.	.	.	+	.	+	.	.	+
Crateva	religiosa	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Croton	aromaticus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.
Croton	laccifer	+	.	.	.	.	+	.	+	+	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	+	+
*Croton	moonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
Croton	thwaitesianus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cryptocarya	wightiana	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
*Cullenia	ceylanica	+	.	+	.	.	+	.	+	+	.	+	.	.	.	+	.	.	.	.	.	+	.	.	+	.	+
*Cullenia	rosayroana	+	+	+	.	.	+	+	+	+	.	+	+	.	+	+	.	.	.	.	.	+	.	.	+	+	+
Cyathocalyx	zeylanicus	+	+	+	.	+	.	+	+	+	.	+	+	.	+	.	+	.	.	+	+	+	.	+	+	+	+
Cycas	circinalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dalbergia	pseudo-sissoo	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Debregeasia	wallichiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Derris	canarensis	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Derris	parviflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Derris	scandens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Desmos	elegans	.	+	.	.	+	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Desmos	zeylanica	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dialium	ovoideum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dianella	ensifolia	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dichapetalum	gelonioides	.	+	+	.	+	+	+	+	+	.	+	+	.	.	+	.	.	.	+	+	+	.	+	+	+	+
Dichapetalum	helferanum	+	+	+	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	+	.	.
*Dichapetalum	zeylanicum	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Dichilanthe	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Dichrostachys	cinerea	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
*Dillenia	retusa	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Dimorphocalyx	glabellus	.	+	.	.	.	.	+	.	.	.	+	.	.	+	.	.	+	.	.	.	.	+	.	.	.	+
*Diospyros	acuminata	+	.	+	.	.	+	+	+	.	+	+	.	.	+	+	.	.	.	.	+	+	.	+	.	+	+
*Diospyros	attenuata	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Diospyros	albiflora	.	.	.	.	.	.	.	+	+	.	+	.	.	+	+	.	.	.	.	.	+	.	+	.	+	+
*Diospyros	acuta	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
*Diospyros	chaetocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.
Diospyros	crumenata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	ebenum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	ferrea	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
*Diospyros	hirsuta	.	+	+	.	.	.	+	+	+	.	.	.	.	+	+	.	.	.	.	.	+	.	+	.	.	+
Diospyros	insignis	+	+	.	.	+	+	+	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	+	+	+
Diospyros	insignoides	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	malabarica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	montana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Diospyros	moonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
*Diospyros	oblongifolia	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+
*Diospyros	oppositifolia	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Diospyros	ovalifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
*Diospyros	quaesita	.	+	.	.	+	.	.	+	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	+	+
Diospyros	racemosa	.	.	+	.	.	+	.	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	+	.	+	+
Diospyros	sylvatica	.	+	.	.	+	+	.	+	+	.	.	.	.	.	.	+	.	.	+	+	.	.	.	+	+	.
*Diospyros	thwaitesii	.	+	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Diospyros	walkeri	.	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Diplodiscus	verrucosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
*Dipterocarpus	glandulosus	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Dipterocarpus	hispidus	.	+	.	.	.	.	+	.	.	.	.	+	.	.	+	+	.	.	.	.	+	.	.	+	.	.
*Dipterocarpus	insignis	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+
*Dipterocarpus	zeylanicus	+	+	+	.	.	+	+	+	+	+	+	+	.	+	.	+	.	.	+	+	.	.	+	+	+	+
Doona	affinis	.	+	.	.	.	.	+	.	.	+	+	+	.	.	+	+	.	.	.	+	+	.	.	.	.	+
Doona	congestiflora	.	.	.	.	.	.	+	+	+	.	+	.	.	.	+	+	.	.	.	.	+	.	.	.	.	+
*Doona	gardneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Doona	macrophylla	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+
Doona	nervosa	.	.	+	.	.	+	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+
*Doona	oblonga	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	+
Doona	trapezifolia	.	.	.	.	.	.	+	+	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
Doona	venulosa	.	+	.	.	.	.	+	.	.	+	+	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.
Doona	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dracaena	thwaitesii	+	+	+	.	+	+	+	+	+	+	+	.	.	+	+	+	.	.	+	+	+	.	+	+	.	+
Drypetes	roxburghii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Drypetes	sepiaria	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
Dysoxylum	ficiforme	.	+	+	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	+
Dysoxylum	pyriforme	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ecbolium	ligustrinum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ehretia	laevis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Elaeocarpus	amoenus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Elaeocarpus	glandulifer	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Elaeocarpus	serratus	.	.	.	.	.	+	.	+	+	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Elaeocarpus	subvillosus	.	.	+	.	.	+	+	+	+	+	.	.	.	.	+	.	.	.	.	.	+	.	+	.	+	+
Elaeagnus	latifolia	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Embelia	ribes	.	.	.	.	.	.	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	.	+
*Enicosanthum	acuminata	.	.	+	.	.	+	+	+	.	+	+	.	.	.	+	.	.	.	.	.	+	.	+	+	.	+
Entada	zeylanica	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+
Eranthemum	capense	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Erycibe	paniculata	.	+	+	.	+	.	+	+	+	+	+	+	.	.	+	+	.	.	+	+	+	.	+	+	+	+
Erythroxylum	indicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Erythroxylum	moonii	.	+	.	+	.	+	.	+	+	+	+	.	.	.	.	.	+	.	.	.	.	.	+	.	+	.
*Erythroxylum	obtusifolium	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Erythroxylum	zeylanicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Erythrospermum	zeylanicum	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Eugenia	bracteata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
*Eugenia	fulva	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Eugenia	glabra	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Eugenia	rivulorum	.	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	+	.	.	+
*Eugenia	rufo-fulva	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+
*Eugenia	terpnophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eugenia	thwaitesii	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
*Eugenia	wildenowii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euodia	lunu-ankenda	.	+	+	.	.	.	.	+	.	.	.	.	.	+	+	+	.	.	.	.	.	.	+	.	.	.
*Euonymus	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Euonymus	walkeri	.	+	.	.	+	.	+	.	+	+	+	+	.	.	+	.	.	.	+	+	+	.	+	.	+	+
Eupatorium	odoratum	.	.	+	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	+
Euphorbia	antiquorum	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	+
Euphoria	longana	.	+	+	.	+	.	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Eurya	acuminata	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Excoecaria	agallocha	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Fagraea	ceilanica	.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	+
Fahrenheitia	minor	.	.	+	.	.	.	+	.	.	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
Fahrenheitia	zeylanica	.	+	.	.	.	.	+	+	+	+	+	+	.	.	+	.	.	.	+	.	.	.	+	+	+	+
Ficus	asperrima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Ficus	callosa	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	caulocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Ficus	diversiformis	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ficus	fergusonii	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.
Ficus	hispida	+	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+
Ficus	laevis	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
Ficus	microcarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	mollis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Ficus	nervosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Ficus	racemosa	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	religiosa	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	tinctoria	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Filicium	decipiens	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Firmiana	colorata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flacourtia	indica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flagellaria	indica	+	+	+	.	+	+	+	.	.	.	+	.	.	+	.	+	.	.	+	+	+	.	.	+	.	.
Freycinetia	walkeri	.	.	+	.	.	+	.	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
Gaertnera	divericata	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+
*Gaertnera	rosea	+	.	.	.	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	+	.	.	.	.	.	.
*Gaertnera	vaginans	.	+	+	.	+	+	+	+	+	+	+	+	.	+	+	.	.	.	+	+	+	.	+	+	+	+
*Gaertnera	walkeri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Garcinia	echinocarpa	.	.	.	.	+	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.
*Garcinia	hermonii	.	+	+	.	.	+	+	+	+	+	+	.	.	+	+	.	.	.	.	.	+	.	.	.	+	+
Garcinia	morella	+	+	+	.	+	+	+	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Garcinia	quaesita	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Garcinia	spicata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
*Garcinia	terpnophylla	.	+	+	.	.	.	+	+	+	+	+	.	.	.	+	.	.	.	.	.	+	.	.	.	+	+
*Garcinia	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Garcinia	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
*Gardenia	crameri	.	+	+	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Gardenia	latifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Gironniera	scabrida	+	+	+	.	.	+	.	.	.	+	+	+	.	+	.	.	.	.	.	.	+	.	.	.	.	+
*Glenniea	unijuga	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Glochidion	acutifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Glochidion	moonii	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Glochidion	nemorale	.	+	+	.	.	.	.	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
Glochidion	stellatum	.	+	.	.	+	.	+	+	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	+	.	.
Glycosmis	angustifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glycosmis	mauritiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glycosmis	pentaphylla	+	+	+	.	.	+	+	+	+	.	+	+	.	+	.	+	.	.	.	+	+	.	+	+	+	+
Gmelina	asiatica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gomphia	serrata	.	+	+	.	+	+	+	+	+	+	+	+	.	.	+	+	.	.	+	+	+	.	+	+	+	+
*Goniothalamus	hookeri	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Goniothalamus	salicina	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
*Goniothalamus	thomsonii	.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	+	.	.	+	.	.
Goniothalamus	thwaitesii	.	+	.	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	.	+	+
*Gordonia	ceylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Grewia	carpinifolia	.	+	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	+	.	.	+	+	.	.
Grewia	orientalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Grewia	rothii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Gymnema	sylvestre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Gymnosporia	emerginata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.
Gyrinops	walla	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Gyrocarpus	americanus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Hedyotis	fruticosa	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+
*Helicia	ceylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hibiscus	eriocarpus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Hibiscus	furcatus	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hibiscus	molochinus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hibiscus	tiliaceus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hiptage	benghalensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Holarrhena	mitis	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+
Homalium	zeylanicum	.	.	.	.	.	.	.	+	.	+	+	+	.	.	+	.	.	.	.	.	.	.	.	+	+	+
*Hopea	discolor	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Hopea	jucunda	.	+	+	.	.	.	+	+	+	.	+	+	.	.	+	+	.	.	.	.	.	.	.	.	+	.
Hopea	modesta	.	.	.	.	.	+	+	.	.	.	+	.	.	+	+	.	.	.	.	.	+	.	+	.	.	+
Horsfieldia	irya	.	+	+	.	+	.	+	+	+	+	+	+	.	+	+	.	.	.	+	+	+	.	+	+	+	+
*Hortonia	floribunda	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Hugonia	ferruginea	+	+	.	.	+	+	+	+	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+
Hugonia	mystax	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Humboldtia	laurifolia	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Hunteria	zeylanica	+	+	.	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	+	+	+	+
*Hydnocarpus	octandra	.	+	+	.	.	+	+	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	+	+	+
Hydnocarpus	venenata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Ilex	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Indigofera	tinctoria	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Isonandra	lanceolata	.	+	.	.	+	.	+	+	+	+	+	.	.	+	+	+	.	.	.	.	+	.	.	+	+	.
Isonandra	zeylanica	.	+	+	.	.	+	+	+	+	+	+	.	.	+	+	.	.	.	.	+	+	.	+	.	+	+
Ixora	arborea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
*Ixora	jucunda	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Ixora	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Jasminum	angustifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Jasminum	auriculatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Jasminum	flexile	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Justicia	betonica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kadsura	heteroclita	+	.	.	.	.	+	+	+	+	.	.	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
Kendrickia	walkeri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kokoona	zeylanica	+	+	+	.	+	.	.	+	.	.	+	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.
Lantana	camara	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	+	.
Laportea	bulbifera	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lasianthus	gardneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lasianthus	moonii	.	+	+	.	.	.	+	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	+	+
Lasianthus	obliquus	.	.	.	.	.	.	.	+	+	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.
*Lasianthus	oliganthus	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
*Lasianthus	walkeranus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Lawsonia	inermis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Leea	indica	.	+	+	.	.	+	.	.	+	.	.	+	.	+	+	.	.	.	.	.	+	.	+	+	+	+
Lepisanthes	erecta	.	+	+	.	.	.	+	.	+	+	.	.	.	.	+	+	.	.	+	+	+	.	+	+	+	.
Lepisanthes	senegalensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
*Lepisanthes	simplicifolia	.	.	+	.	+	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.
*Lepisanthes	tetraphylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.
*Lijndenia	capitellata	.	+	+	.	.	+	+	+	+	+	+	.	.	.	+	.	.	.	.	.	+	.	+	+	+	.
Limonia	acidissima	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
*Litsea	gardneri	.	.	+	.	.	.	+	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
*Litsea	glaberrima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Litsea	iteodaphne	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Litsea	longifolia	+	+	+	.	+	.	+	+	+	+	+	.	.	+	+	+	.	.	+	+	+	.	+	+	+	+
*Litsea	nemoralis	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Loeseneriella	arnottiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	+
Loeseneriella	macrantha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Loxococcus	rupicola	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
Lumnitzera	racemosa	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Luvunga	angustifolia	.	+	+	.	+	.	.	+	+	+	+	+	.	.	+	+	.	.	.	.	+	.	+	.	+	+
*Macaranga	digyna	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	+	.
Macaranga	peltata	.	.	+	.	.	+	.	+	+	.	.	+	.	+	+	.	.	.	.	.	+	.	+	+	+	+
*Madhuca	fulva	.	+	+	.	.	.	+	.	+	+	+	+	.	+	+	.	.	.	+	.	+	.	.	.	.	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
*Madhuca	moonii	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Maesa	perrottetiana	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Mallotus	eriocarpus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Mallotus	fuscescens	+	+	.	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	.	+	+	.	+	+	+	+
Mallotus	philippensis	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.
Mallotus	rhamnifolius	.	+	+	+	.	.	+	.	.	.	.	.	.	.	+	.	+	+	.	.	.	+	.	.	.	.
Mallotus	tetracoccus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Mallotus	walkerae	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Mangifera	zeylanica	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Manilkara	hexandra	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.
*Mastixia	arborea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Mastixia	macrophylla	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mastixia	nimali	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+
Mastixia	tetrandra	.	+	+	.	.	+	+	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Medinilla	maculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Melastoma	malabathricum	.	.	+	.	.	.	+	+	+	.	+	+	.	+	+	.	.	.	.	.	+	.	+	.	.	+
Meliosma	simplicifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	capitellatum	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Memecylon	clarkeanum	.	.	+	.	.	.	+	+	+	.	+	.	.	+	+	.	.	.	.	.	+	.	.	.	.	+
*Memecylon	discolor	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	ellipticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Memecylon	fuscescens	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	+
*Memecylon	grande	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	giganteum	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	hookeri	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Memecylon	macrocarpum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	macrophyllum	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
*Memecylon	orbiculare	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	petiolatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	procerum	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.
*Memecylon	rhinophyllum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Memecylon	rivulare	.	.	+	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	rostratum	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	.	+	+	+
*Memecylon	sylvaticum	.	+	.	.	.	+	+	.	.	+	.	+	.	.	+	+	.	.	.	.	+	.	+	+	.	+
Memecylon	umbellatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	urceolatum	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.
*Memecylon	varians	.	+	.	.	+	+	+	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.
Mesua	ferrea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mesua	pulchela	+	+	.	.	+	+	+	+	.	.	+	.	.	+	+	+	.	.	+	+	.	.	.	+	+	+
Mesua	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+
Microtropis	wallichiana	.	.	+	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	+
Miliusa	indica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
*Miliusa	zeylanica	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Mimusops	elengi	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.
Mischodon	zeylanicus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Mitragyna	parvifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Murraya	koenigii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Mussaenda	frondosa	.	+	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+
Mussaenda	glabrata	+	+	.	.	+	.	+	+	.	.	.	.	.	+	+	+	.	.	+	+	.	.	.	+	+	.
Myristica	dactyloides	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	.
*Nargedia	macrocarpa	.	+	.	.	.	.	+	.	+	+	+	+	.	.	+	.	.	.	.	.	+	.	.	.	+	+
*Neolitsea	cassia	.	+	+	.	+	+	+	+	+	.	+	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+
*Nepenthes	distillatoria	.	.	+	.	.	.	+	+	+	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
Nephelium	lappaceum	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nipa	fruticans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nothapodytes	foetida	.	.	+	.	.	+	.	.	.	+	+	.	.	+	+	.	.	.	.	.	+	.	+	.	.	+
Nothapodytes	nimmoniana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nothopegia	beddomei	.	+	+	.	.	+	+	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	+	+	+
*Ochlandra	stridula	+	+	+	.	+	+	+	.	+	+	+	+	.	+	+	.	.	.	+	.	+	.	+	+	+	+
*Ochna	jabotapita	.	+	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	+	.	+	.	.	.	+	+
Ochna	lanceolata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ocimum	gratissimum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Olax	zeylanica	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
*Oncosperma	fasciculatum	.	+	.	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+
Opuntia	dillenii	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Osbeckia	aspera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Osmelia	gardneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pagiantha	dichotoma	+	.	.	.	+	.	.	+	+	+	.	.	.	+	.	+	.	.	.	.	.	.	.	+	+	.
*Palaquium	canaliculatum	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Palaquium	grande	.	+	+	.	.	.	+	.	.	+	.	.	.	+	+	.	.	.	.	.	+	.	.	+	+	.
Palaquium	hinmolpedde	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Palaquium	pauciflorum	.	+	.	.	.	.	.	+	+	.	.	+	.	.	.	+	.	.	+	+	.	.	.	.	+	+
*Palaquium	petiolare	.	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	.	+	+	.	+	+	+	+
Palaquium	rubiginosum	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Palaquium	thwaitesii	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.
*Pandanus	thwaitesii	+	+	+	.	+	+	+	+	+	.	+	.	.	+	.	.	.	.	.	.	+	.	+	+	+	+
*Paramignya	armata	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	+	.
Paramignya	monophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Passiflora	edulis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pavetta	blanda	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pavetta	indica	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pericopsis	mooniana	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Persea	macrantha	.	.	.	.	.	.	+	+	+	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	+	.
*Petchia	ceylanica	.	+	+	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.
*Phoenix	zeylanica	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Phoenicanthus	coriacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Phoenicanthus	obliqua	+	+	.	.	+	+	+	.	+	.	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Phyllanthus	indicus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.
Phyllanthus	pinnatus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
Phyllanthus	polyphyllus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Phyllochlamys	taxoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Piper	trineuron	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.
Pleiospermium	alatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.
Pleurostylia	opposita	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polyalthia	cerasoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Polyalthia	korinti	+	+	+	.	+	+	+	.	+	+	+	+	.	+	+	+	+	.	.	+	+	.	+	+	+	+
Polyalthia	longifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polyalthia	suberosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pometia	tomentosa	+	.	.	.	.	+	.	.	.	+	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+
Pongamia	pinnata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Premna	latifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Premna	tomentosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.
Prismatomeris	tetrandra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Prunus	walkeri	.	+	.	.	.	.	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Pseudocarapa	championii	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Psychotria	dubia	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Psychotria	glandulifera	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Psychotria	nigra	+	+	.	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Psychotria	sarmentosa	.	.	.	.	.	.	.	.	.	+	+	+	.	+	+	.	.	.	+	+	+	.	+	.	.	+
*Psychotria	stenophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Psychotria	waasii	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Pterospermum	canescens	+	+	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+	+	+
*Ptychopyxis	thwaitesii	.	+	.	.	.	.	+	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
*Putranjiva	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Randia	malabarica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Rapanea	robusta	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Reissantia	indica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhizophora	mucronata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhynchotechum	permolle	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Rinorea	virgata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rourea	minor	.	.	.	.	.	+	+	+	+	+	+	+	.	.	+	+	.	.	+	+	.	.	.	+	+	.
Salacia	diandra	+	+	.	.	+	.	+	.	+	+	+	.	.	.	+	.	.	.	.	.	+	.	.	.	+	+
Salacia	oblonga	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salacia	reticulata	+	+	+	.	.	+	+	+	+	+	+	+	.	+	+	+	+	+	.	+	+	+	+	+	+	+
Salvadora	persica	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Samadera	indica	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+
Sapium	insigne	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sapindus	emarginatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Saprosma	foetens	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saprosma	indicum	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
*Saprosma	scabridum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Sarcocca	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sarcandra	chloranthoides	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Schefflera	emarginata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Schefflera	racemosa	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Schleichera	oleosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Schumacheria	angustifolia	.	+	.	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Schumacheria	castaneifolia	.	+	+	.	+	+	+	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	+	+	+
Scleropyrum	pentandrum	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Scolopia	acuminata	.	+	+	.	+	.	+	+	+	+	+	+	.	+	+	+	.	.	.	+	+	.	+	.	+	+
*Scolopia	pusilla	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Scutia	myrtina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
*Scutinanthe	brunnea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Secamone	emetica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Securinega	leucopyrus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Semecarpus	acuminata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Semecarpus	gardneri	+	+	.	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	.	+	+	.	+	.	+	+
*Semecarpus	moonii	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+
*Semecarpus	nigro-viridis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Semecarpus	obovata	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Semecarpus	parvifolia	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+
*Semecarpus	pseudo-emerginatus	.	+	+	.	.	+	+	+	+	.	+	.	.	+	+	.	.	.	.	.	+	.	+	+	.	.
*Semecarpus	pubescens	.	+	.	.	.	.	+	.	+	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+
*Semecarpus	subpeltata	.	.	.	.	.	.	+	+	+	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
*Semecarpus	walkeri	.	+	+	.	.	.	.	+	+	+	+	.	.	+	+	.	.	.	+	.	+	.	+	+	+	.
*Shorea	disticha	.	+	.	.	.	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Shorea	dyeri	.	+	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+
Shorea	hulanidda	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Shorea	lissophylla	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+
*Shorea	oblongifolia	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	+
*Shorea	pallescens	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Shorea	stipularis	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	+
Smilax	prolifera	.	+	.	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	.	+	.	+	+	+	+
Smilax	zeylanica	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Solanum	pubescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Sonneratia	caseolaris	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Stemonoporus	acuminatus	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Stemonoporus	canaliculatus	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stemonoporus	kanneliyensis	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Stemonoporus	reticulatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
*Stemonoporus	wightii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stenosiphonium	cordifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Stemonurus	apicalis	.	+	+	.	.	.	+	+	+	+	+	.	.	+	+	.	.	.	.	.	+	.	+	.	+	+
Stemonurus	tetrandrus	.	.	.	.	.	+	+	+	+	+	+	+	.	+	+	+	.	.	+	.	+	.	+	.	+	+
Stephania	japonica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sterculia	balanghas	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Stereospermum	personatum	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Streblus	asper	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Streblus	taxoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Strombosia	nana	.	+	+	.	.	+	+	+	.	.	+	.	.	.	+	+	.	.	.	.	+	.	+	+	+	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Strobilanthes	asperrima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Strobilanthes	paniculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Strychnos	cinnamomifolia	+	+	+	.	+	+	+	+	+	.	+	+	.	+	+	+	.	.	.	+	+	.	+	+	+	+
*Strychnos	micrantha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Strychnos	potatorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Suregoda	angustifolia	+	.	.	.	.	+	+	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+
Suregoda	lanceolata	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Swietenia	macrophylla	+	+	+	.	+	.	+	.	+	.	.	.	.	+	+	+	.	.	.	+	+	.	.	+	+	.
Symplocos	cochinchinensis	+	+	+	.	.	+	+	+	+	.	+	+	.	+	+	.	.	.	+	.	+	.	.	.	+	+
*Symplocos	coronata	.	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+
*Symplocos	cuneata	.	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Symplocos	hispidula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
Symplocos	macrophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Symplocos	pulchra	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.
*Syzygium	alubo	.	+	.	.	+	.	+	+	+	+	+	.	.	+	+	.	.	.	.	.	+	.	+	.	+	+
Syzygium	aqueum	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	caryophyllatum	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	cordifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Syzygium	cumini	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	cylindricum	+	.	+	.	.	.	+	+	+	.	.	.	.	.	+	.	.	.	.	+	+	.	.	+	.	+
*Syzygium	firmum	.	+	.	.	.	.	+	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	+	+	+
*Syzygium	gardneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Syzygium	grande	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Syzygium	hemisphericum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	lissophyllum	.	.	.	.	.	.	.	+	+	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	makul	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	micranthum	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
*Syzygium	neesianum	.	+	+	.	+	+	+	+	+	+	+	.	.	+	+	+	.	.	+	+	+	.	+	+	+	+
*Syzygium	revolutum	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Syzygium	rubicundum	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	turbinatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Syzygium	wightianum	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Syzygium	zeylanicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tamarindus	indica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tarenna	asiatica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Tarenna	flava	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	+	+
Tephrosia	purpurea	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Terminalia	arjuna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Terminalia	belerica	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Terminalia	chebula	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Terminalia	parviflora	+	+	+	.	+	.	+	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	.
Tetracera	sarmentosa	+	+	.	.	+	+	+	+	+	.	.	+	.	+	.	+	.	.	+	+	+	.	+	+	+	+
Tetrastigma	nilagiricum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Timonius	jambosella	.	.	+	.	.	+	+	+	+	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	+	+
Toddalia	asiatica	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Tolypanthus	gardneri	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trema	orientale	.	.	.	.	.	+	.	.	+	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	+
*Trichadenia	zeylanica	.	+	.	.	+	+	+	+	+	.	+	.	.	.	+	.	.	.	.	+	+	.	.	+	+	.
*Tricalysia	dalzelli	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Tricalysia	erythrospora	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Turpinia	malabarica	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Uncaria	elliptica	+	+	+	.	.	+	+	+	+	+	.	+	.	.	+	.	.	.	.	.	+	.	+	+	+	+
*Urophyllum	ellipticum	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Urophyllum	zeylanicum	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Uvaria	cordata	+	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.
Uvaria	macrocarpa	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Uvaria	narum	.	.	+	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+
*Uvaria	semecarpifolia	.	.	.	.	.	.	+	+	+	+	.	+	.	+	+	.	.	.	.	.	+	.	.	.	+	+
*Uvaria	sphenocarpa	+	.	+	.	+	.	+	+	+	.	+	+	.	.	+	+	.	.	+	+	+	.	+	.	+	+
*Vateria	copallifera	.	+	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
*Vatica	affinis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.
Ventilago	gamblei	+	.	+	.	.	+	.	.	.	+	+	.	.	+	+	.	.	.	+	.	+	.	+	+	.	+
Ventilago	maderaspatana	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Vernonia	arborea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vitex	altissima	+	+	+	.	+	.	+	+	+	+	.	+	.	+	+	+	+	.	+	+	+	.	+	.	+	+
Walsura	piscidia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Walsura	trifoliata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.
Wattakaka	volubilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Wendlandia	bicuspidata	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Willughbeia	cirrhifera	.	+	+	.	.	+	+	.	+	+	.	.	.	+	+	+	.	.	.	+	.	.	+	.	+	+
*Wormia	triquetra	.	+	+	.	.	+	+	+	+	+	+	.	.	+	+	.	.	.	.	.	+	.	+	.	.	+
*Wrightia	angustifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Xanthophyllum	geminiflorum	.	+	+	.	.	+	+	+	+	.	.	.	.	+	+	.	.	.	.	.	+	.	+	.	.	.
*Xylopia	championii	.	+	+	.	+	+	+	+	+	.	.	.	.	+	+	+	.	.	+	+	+	.	+	.	+	+
*Xylopia	nigricans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Xylopia	parvifolia	+	+	+	.	+	+	+	.	+	+	.	+	.	+	.	+	.	.	+	+	+	.	+	+	+	+
*Zanthoxylum	caudatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Zizyphus	mauritiana	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Zizyphus	napeca	.	+	.	+	.	.	.	+	+	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	+	+
Zizyphus	oenoplia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Abarema	bigemina	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.
Abrus	precatorius	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Abutilon	asiaticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Abutilon	fruticosum	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Acacia	caesia	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Acacia	eburnea	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Acanthus	ilicifolius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Acronychia	pedunculata	+	+	+	+	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Actephila	neilgherrensis	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Actinodaphne	albida	+	+	+	+	.	.	.	.	+	+	.	+	.	+	+	+	.	+	.	+	.	+	.	.	.	.
*Actinodaphne	albifrons	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Actinodaphne	candolleana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Actinodaphne	elegans	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.
Adenia	hondala	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	+	+	.	.	.
Adenia	wightiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.
*Adenanthera	bicolor	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.
*Adinandra	lasiopetala	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aegiceras	corniculatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.
Aganosma	cymosa	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
*Aglaia	apiocarpa	+	+	+	+	.	.	.	.	+	+	.	.	+	+	+	.	+	+	+	+	+	+	.	.	.	.
Aglaia	congylos	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Aglaia	elaeagnoidea	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Agrostistachys	cerumica	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.
*Agrostistachys	coriacea	+	.	.	.	.	.	.	.	+	.	.	+	.	+	+	+	+	.	+	.	.	.	.	.	.	.
Agrostistachys	indica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aidia	gardneri	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.
*Alangium	salviifolium	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	+	.	+	.	.	.
Albizia	chinensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.
Albizia	odoratissima	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Allophylus	varians	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Allophylus	zeylanicus	+	+	+	+	.	.	.	.	+	.	.	+	+	+	+	.	+	+	+	+	+	+	.	.	.	.
Alphonsea	sclerocarpa	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Alseodaphne	semecarpifolia	.	.	+	.	.	.	+	.	+	.	.	.	.	+	.	+	+	.	+	.	+	+	.	.	.	.
Alstonia	macrophylla	+	.	+	+	.	.	.	.	+	.	.	+	+	.	.	+	.	+	.	+	+	+	+	.	.	.
Alstonia	scholaris	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.
Ampelocissus	wightiana	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anamirta	cocculus	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ancistrocladus	hamatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Anisophyllea	cinnamomoides	+	+	+	+	.	.	.	.	+	+	.	+	+	.	+	+	+	+	+	+	+	+	+	.	.	.
Annona	squamosa	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anodendron	manubriatum	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Antidesma	acidum	+	+	+	+	.	.	.	.	+	.	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Antidesma	bunius	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Apama	siliquosa	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Aphania	bifoliata	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Aporosa	cardiosperma	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	+	+	.	+	+	.	.	.
*Aporosa	lanceolata	+	+	+	+	.	.	.	.	+	+	.	+	+	.	+	+	+	+	+	+	+	+	+	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Ardisia	gardneri	.	.	+	+	.	.	.	.	+	.	.	.	.	.	+	+	+	.	.	+	.	+	.	.	.	.
*Ardisia	moonii	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	+	.	.	.	.	.
Ardisia	pauciflora	.	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Areca	catechu	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	+	.	.	.
Argyreia	hirsuta	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Argyreia	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Aristolochia	ringens	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Artabotrys	zeylanicus	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Artocarpus	gomezianus	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Artocarpus	heterophyllus	.	+	+	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	+	.	.	.
*Artocarpus	nobilis	.	+	+	+	.	.	.	.	+	+	.	+	+	.	.	+	+	+	+	.	+	+	+	.	.	.
Asparagus	falcatus	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Atalantia	ceylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Atalantia	monophylla	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Avicennia	marina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Axinandra	zeylanica	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	+	.	+	+	.	.	.	.
Azadirachta	indica	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Azima	tetracantha	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Barringtonia	acutangula	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Barringtonia	racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Bauhinia	racemosa	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bauhinia	tomentosa	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Begonia	malabarica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Berrya	cordifolia	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Bhesa	ceylanica	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	.	+	+	+	+	.	+	+	.	.	.
Blachia	umbellata	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Boehmeria	malabarica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bombax	ceiba	.	+	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.
Breynia	vitis-idaea	.	.	.	+	.	.	.	.	+	.	.	.	+	.	+	+	+	+	.	+	+	+	+	.	.	.
*Bridelia	moonii	+	.	+	+	.	.	.	.	+	+	.	+	.	.	.	.	.	+	.	+	+	+	+	.	.	.
Bridelia	retusa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Brucea	javanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Bruguiera	gymnorhiza	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.
Bruguiera	sexangula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Byrsophyllum	ellipticum	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.	.
Caesalpinia	bonduc	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Caesalpinia	crista	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Caesalpinia	hymenocarpa	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calamus	delicatulus	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.
*Calamus	digitatus	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Calamus	ovoideus	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calamus	pseudo-tenuis	.	+	+	+	.	.	.	.	+	+	.	.	.	+	+	.	+	.	.	.	.	+	.	.	.	.
*Calamus	radiatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calamus	rivalis	+	+	+	+	.	.	.	.	+	+	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.
Calamus	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	+	+	.	+	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Calamus	zeylanicus	+	.	+	+	.	.	.	+	+	.	.	+	+	.	+	.	+	+	+	+	.	+	.	.	.	.
Callicarpa	tomentosa	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calophyllum	acidus	.	+	+	+	.	.	.	.	+	.	.	.	.	+	+	.	+	+	+	.	.	.	+	.	.	.
*Calophyllum	bracteatum	.	+	+	+	.	.	.	.	+	+	.	+	+	+	.	.	+	+	+	+	+	+	.	.	.	.
*Calophyllum	calaba	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.
*Calophyllum	cordato-oblongum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Calophyllum	moonii	+	.	+	.	.	.	.	.	+	.	.	+	.	.	.	+	.	+	+	.	+	.	+	.	.	.
Calophyllum	soulattri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.
*Calophyllum	thwaitesii	+	.	+	+	.	.	.	.	+	+	.	+	.	.	.	+	.	+	+	+	+	+	+	.	.	.
Camellia	sinensis	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Campnosperma	zeylanica	+	.	+	.	.	.	.	.	+	+	.	+	+	.	.	.	+	+	+	+	.	+	.	.	.	.
*Canarium	zeylanicum	+	.	+	+	.	.	.	.	+	+	.	+	+	.	.	+	+	+	+	+	+	+	+	.	.	.
*Canthium	campanulatum	+	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Canthium	coromandelicum	.	.	.	+	+	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	+
*Canthium	dicoccum	+	+	+	+	.	+	+	+	+	.	.	+	+	+	+	.	+	+	+	.	+	.	+	.	.	+
Canthium	puberulum	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Canthium	rheedii	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	baducca	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	divaricata	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	grandis	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	moonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	pedunculosa	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	sepiaria	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capparis	zeylanica	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carallia	brachiata	.	+	+	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.
*Carallia	calycina	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	+	+	.	+	.	.	.	.
Carissa	spinarum	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
Carmona	microphylla	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Carmona	retusa	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Caryota	urens	.	+	+	+	.	.	.	.	+	+	.	.	+	.	+	+	+	+	+	.	+	+	+	.	.	.
Casearia	elliptica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Casearia	zeylanica	.	.	.	.	+	+	+	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.
Cassipourea	ceylanica	.	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Cassine	glaucum	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Cassia	auriculata	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Cassia	fistula	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Cassia	roxburghii	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cassia	siamea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cassia	tora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Catunaregam	malabarica	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Catunaregam	spinosa	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cayratia	trifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Celtis	timorensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Cerbera	odollam	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Chaetocarpus	castanocarpus	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	+	+	+	+	+	+	+	+	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Chaetocarpus	coriaceus	+	.	.	+	.	.	.	.	+	+	.	+	.	.	.	+	.	+	.	+	.	+	.	.	.	.
Chassalia	ophioxyloides	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
*Chionanthus	albidiflora	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chloroxylon	swietenia	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Chonemorpha	fragrans	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.
Chrysophyllum	lanceolatum	+	.	+	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	+	.	+	+	.	.	.	.
Chukrasia	velutina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Cinnamomum	cappuru-coronde	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
*Cinnamomum	dubium	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
*Cinnamomum	sinharajensis	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Cinnamomum	verum	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	.	.	.	.
Cinnamomum	zeylanicum	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Cissus	acuminata	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cissus	heyneana	.	.	+	+	.	.	.	.	+	.	.	+	+	.	.	+	+	+	+	+	+	.	+	.	.	.
Cissus	quadrangularis	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cissus	trilobata	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	+	+	.	.	.
Cissus	wightiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Clausena	dentata	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Clausena	indica	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.
Cleidion	spiciflorum	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Cleghornia	acuminata	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.
*Cleistanthus	ferrugineus	.	+	+	.	.	.	.	.	+	.	.	.	+	.	.	+	.	+	+	+	.	.	.	.	.	.
*Cleistanthus	pallidus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cleistanthus	patulus	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	+	+	+	+	.	.	.
Cleistocalyx	operculataus	.	.	.	+	.	.	.	.	+	.	.	.	+	.	+	.	+	.	+	+	+	.	.	.	.	.
Clerodendrum	infortunatum	.	.	+	+	+	.	.	.	+	.	+	.	+	+	+	+	.	.	+	.	+	+	+	.	.	.
Clerodendrum	inerme	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Clerodendrum	paniculatum	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.
Clidemia	hirta	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	+	.	.	+	.	.	.
Coffea	travancorensis	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	.
Coffea	wightiana	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Commiphora	caudata	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Connarus	championii	+	+	+	+	.	.	.	.	+	+	.	+	+	+	.	+	+	+	+	+	+	+	+	.	.	.
Connarus	monocarpus	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cordia	dichotoma	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cordia	gharaf	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cordia	monoica	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cordia	oblongifolia	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Coscinium	fenestratum	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	+	+	+	+	+	+	+	+	.	.	.
*Cotylelobium	scabriusculum	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.
Crateva	religiosa	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Croton	aromaticus	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Croton	laccifer	.	.	.	+	+	.	+	+	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+
*Croton	moonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Croton	thwaitesianus	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Cryptocarya	wightiana	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
*Cullenia	ceylanica	.	+	+	+	.	.	.	.	+	.	.	+	+	+	+	.	+	+	+	+	.	.	.	.	.	.
*Cullenia	rosayroana	+	.	+	+	.	.	.	.	+	.	.	+	+	.	.	.	.	+	+	+	+	+	+	.	.	.
Cyathocalyx	zeylanicus	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	.	+	+	+	.	+	.	+	.	.	.
Cycas	circinalis	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dalbergia	pseudo-sissoo	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Debregeasia	wallichiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Derris	canarensis	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.
Derris	parviflora	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Derris	scandens	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Desmos	elegans	+	.	+	+	.	.	.	.	+	+	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.
*Desmos	zeylanica	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Dialium	ovoideum	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dianella	ensifolia	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dichapetalum	gelonioides	+	+	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	.	+	+	.	.	.	.
Dichapetalum	helferanum	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
*Dichapetalum	zeylanicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Dichilanthe	zeylanica	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dichrostachys	cinerea	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Dillenia	retusa	+	+	+	+	.	.	.	.	.	+	.	+	+	+	.	+	.	+	.	+	+	+	+	.	.	.
Dimorphocalyx	glabellus	.	.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Diospyros	acuminata	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	+	+	+	.	.	.
*Diospyros	attenuata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Diospyros	albiflora	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	+	.	+	.	.	.	.	.
*Diospyros	acuta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Diospyros	chaetocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	crumenata	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	ebenum	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	ferrea	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Diospyros	hirsuta	.	+	+	.	.	.	.	.	+	.	.	+	+	.	.	.	.	+	+	+	.	+	+	.	.	.
Diospyros	insignis	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Diospyros	insignoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	malabarica	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	montana	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Diospyros	moonii	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Diospyros	oblongifolia	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Diospyros	oppositifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diospyros	ovalifolia	.	.	.	.	+	+	+	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+
*Diospyros	quaesita	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.
Diospyros	racemosa	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.
Diospyros	sylvatica	+	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
*Diospyros	thwaitesii	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
*Diospyros	walkeri	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diplodiscus	verrucosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Dipterocarpus	glandulosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Dipterocarpus	hispidus	+	.	+	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.
*Dipterocarpus	insignis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
*Dipterocarpus	zeylanicus	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	+	.	.	+	.	+	.	+	.	.	.
Doona	affinis	+	.	+	.	.	.	.	.	+	+	.	+	.	+	.	.	.	+	+	+	.	+	+	.	.	.
Doona	congestiflora	+	.	.	+	.	.	.	.	+	+	.	+	+	.	.	+	.	+	+	.	+	.	.	.	.	.
*Doona	gardneri	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Doona	macrophylla	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Doona	nervosa	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	+	+	.	.	.
*Doona	oblonga	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Doona	trapezifolia	.	+	.	+	.	.	.	.	+	.	.	.	.	+	+	.	+	+	+	+	.	.	.	.	.	.
Doona	venulosa	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	+	.	+	+	+	.	.	.
Doona	zeylanica	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Dracaena	thwaitesii	.	+	+	+	.	.	.	.	+	+	.	.	+	.	.	.	.	+	+	.	+	.	+	.	.	.
Drypetes	roxburghii	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Drypetes	sepiaria	.	.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Dysoxylum	ficiforme	.	+	+	+	+	.	.	.	+	.	.	.	.	+	+	+	+	.	+	.	.	.	+	.	.	.
Dysoxylum	pyriforme	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ecbolium	ligustrinum	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Ehretia	laevis	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Elaeocarpus	amoenus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Elaeocarpus	glandulifer	.	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.
Elaeocarpus	serratus	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Elaeocarpus	subvillosus	.	.	+	+	.	.	.	.	+	.	.	+	.	+	.	.	+	+	.	+	.	+	.	.	.	.
Elaeagnus	latifolia	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.
Embelia	ribes	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	+	+	+	.	.	.
*Enicosanthum	acuminata	+	.	+	.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	+	+	.	+	+	.	.	.
Entada	zeylanica	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eranthemum	capense	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Erycibe	paniculata	+	+	+	+	.	.	.	.	+	+	.	+	.	+	.	.	+	+	+	+	+	+	.	.	.	.
Erythroxylum	indicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Erythroxylum	moonii	.	.	+	+	+	+	+	.	+	.	.	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.
*Erythroxylum	obtusifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.	.	.	.
Erythroxylum	zeylanicum	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Erythrospermum	zeylanicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eugenia	bracteata	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Eugenia	fulva	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Eugenia	glabra	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Eugenia	rivulorum	.	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.
*Eugenia	rufo-fulva	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	+	.	.	.
*Eugenia	terpnophylla	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eugenia	thwaitesii	.	.	.	+	.	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	+	.	.	.	.	.
*Eugenia	wildenowii	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euodia	lunu-ankenda	+	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	+	.	.	+	.	.	.	.
*Euonymus	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Euonymus	walkeri	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Eupatorium	odoratum	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	+	.	.	+
Euphorbia	antiquorum	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Euphoria	longana	+	+	+	+	.	.	.	.	+	+	.	.	+	.	.	.	+	+	+	+	+	+	+	.	.	.
Eurya	acuminata	.	+	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Excoecaria	agallocha	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.
Fagraea	ceilanica	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	+	+	.	+	.	.	.	+	.	.	.
Fahrenheitia	minor	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.
Fahrenheitia	zeylanica	.	+	.	+	.	.	.	.	+	.	.	+	+	+	+	.	+	+	+	+	+	.	.	.	.	.
Ficus	asperrima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	callosa	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	caulocarpa	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ficus	diversiformis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ficus	fergusonii	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	+	.	+	.	.	.	.	.	.	.	.
Ficus	hispida	.	.	+	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	+	.	.	+	.	.	.
Ficus	laevis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	microcarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Ficus	mollis	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	nervosa	.	.	+	+	.	.	.	.	+	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.
Ficus	racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	religiosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus	tinctoria	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Filicium	decipiens	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.
Firmiana	colorata	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flacourtia	indica	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flagellaria	indica	+	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Freycinetia	walkeri	.	+	+	+	.	.	.	.	+	.	.	.	+	+	+	+	+	+	+	+	+	+	.	.	.	.
Gaertnera	divericata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.
*Gaertnera	rosea	+	.	.	+	.	.	.	.	+	.	.	.	.	+	+	.	+	.	.	+	.	.	.	.	.	.
*Gaertnera	vaginans	+	.	+	+	.	.	.	.	+	+	.	+	+	.	.	.	.	+	+	+	+	+	+	.	.	.
*Gaertnera	walkeri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Garcinia	echinocarpa	.	.	.	+	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
*Garcinia	hermonii	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	+	+	+	+	+	+	+	.	.	.
Garcinia	morella	.	.	+	+	.	.	.	.	+	+	.	+	+	+	.	.	+	+	+	.	.	+	+	.	.	.
*Garcinia	quaesita	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	.
Garcinia	spicata	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Garcinia	terpnophylla	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.
*Garcinia	thwaitesii	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Garcinia	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Gardenia	crameri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.
Gardenia	latifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gironniera	scabrida	+	.	+	+	.	.	.	.	+	+	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.
*Glenniea	unijuga	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Glochidion	acutifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Glochidion	moonii	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
*Glochidion	nemorale	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	+	+	.	.	+	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Glochidion	stellatum	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	+	.	+	.	.	.
Glycosmis	angustifolia	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glycosmis	mauritiana	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Glycosmis	pentaphylla	+	+	+	+	.	.	.	.	+	+	+	.	+	+	+	.	+	+	.	.	+	.	+	.	.	.
Gmelina	asiatica	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gomphia	serrata	+	+	+	+	.	.	.	.	+	+	.	+	+	+	.	+	+	+	+	+	+	+	+	.	.	.
*Goniothalamus	hookeri	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Goniothalamus	salicina	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Goniothalamus	thomsonii	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.
Goniothalamus	thwaitesii	.	+	+	+	.	.	.	.	+	+	.	+	.	+	+	+	+	+	+	+	+	.	.	.	.	.
*Gordonia	ceylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Grewia	carpinifolia	.	+	.	+	.	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.
Grewia	orientalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Grewia	rothii	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Gymnema	sylvestre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Gymnosporie	emerginata	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Gyrinops	walla	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Gyrocarpus	americanus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hedyotis	fruticosa	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	.	.	+	.	+	+	.	.	.
*Helicia	ceylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Hibiscus	eriocarpus	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hibiscus	furcatus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Hibiscus	molochinus	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hibiscus	tiliaceus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Hiptage	benghalensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Holarrhena	mitis	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Homalium	zeylanicum	.	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.
*Hopea	discolor	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Hopea	jucunda	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	+	.	.	+	+	.	.	.
Hopea	modesta	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	+	+	.	+	.	.	.
Horsfieldia	irya	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	+	.	.	+	.	.	.	.
*Hortonia	floribunda	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Hugonia	ferruginea	.	+	+	+	.	.	.	.	+	+	.	.	+	.	.	.	.	.	+	+	+	.	+	.	.	.
Hugonia	mystax	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Humboldtia	laurifolia	.	+	+	.	.	.	.	.	+	+	.	.	+	.	.	+	.	+	+	+	+	+	+	.	.	.
Hunteria	zeylanica	+	.	.	+	.	.	.	.	+	+	.	+	+	.	.	.	.	+	+	.	+	+	.	.	.	.
*Hydnocarpus	octandra	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	.	+	+	+	+	+	+	+	.	.	.
Hydnocarpus	venenata	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ilex	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.
Indigofera	tinctoria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Iscnandra	lanceolata	+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	+	+	+	.	.	.	.	.
Isonandra	zeylanica	.	.	+	+	.	.	.	.	+	.	.	+	.	.	.	+	+	+	+	+	.	+	+	.	.	.
Ixora	arborea	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ixora	jucunda	+	.	+	.	.	.	.	.	+	+	.	+	.	+	.	+	.	+	+	+	+	+	+	.	.	.
Ixora	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Jasminum	angustifolium	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Jasminum	auriculatum	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Jasminum	flexile	.	.	.	+	.	.	.	.	+	.	.	.	+	+	+	.	.	.	+	.	+	.	+	.	.	.
Justicia	betonica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kadsura	heteroclita	.	+	+	+	.	.	.	.	+	.	.	.	+	+	+	.	+	.	+	+	+	.	.	.	.	.
Kendrickia	walkeri	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kokoona	zeylanica	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.
Lantana	camara	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	+
Laportea	bulbifera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lasianthus	gardneri	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Lasianthus	moonii	+	.	.	+	.	.	.	.	+	+	.	+	.	.	+	.	.	+	+	+	+	+	.	.	.	.
Lasianthus	obliquus	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
*Lasianthus	oliganthus	.	.	+	+	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
*Lasianthus	walkeranus	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lawsonia	inermis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Leea	indica	.	.	.	+	.	.	.	.	+	+	.	+	+	+	.	.	.	.	.	+	.	.	.	.	.	.
Lepisanthes	erecta	+	+	+	+	.	.	.	.	+	+	.	.	.	.	.	.	+	.	+	+	.	.	+	.	.	.
Lepisanthes	senegalensis	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lepisanthes	simplicifolia	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.
*Lepisanthes	tetraphylla	.	.	.	+	+	+	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lijndenia	capitellata	+	.	+	.	.	.	.	.	+	+	.	.	.	+	+	+	.	+	.	+	.	+	.	.	.	.
Limonia	acidissima	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Litsea	gardneri	.	.	.	+	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.
*Litsea	glaberrima	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Litsea	iteodaphne	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
*Litsea	longifolia	.	+	+	+	.	.	.	.	+	+	.	+	+	+	+	.	+	+	+	+	+	.	+	.	.	.
*Litsea	nemoralis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Loeseneriella	arnottiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Loeseneriella	macrantha	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Loxococcus	rupicola	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	.	.
Lumnitzera	racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Luvunga	angustifolia	.	+	+	+	.	.	.	.	+	+	.	.	+	.	+	.	+	+	+	+	.	+	.	.	.	.
*Macaranga	digyna	+	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Macaranga	peltata	.	+	+	+	.	.	.	.	+	.	.	+	+	.	+	+	+	+	.	+	+	+	+	.	.	.
*Madhuca	fulva	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	+	+	+	.	.	.	.	.	.
*Madhuca	moonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Maesa	perrottetiana	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	.
Mallotus	eriocarpus	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Mallotus	fuscescens	+	.	+	.	.	.	.	.	+	+	.	+	+	.	.	+	.	+	+	.	+	.	+	.	.	.
Mallotus	philippensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mallotus	rhamnifolius	.	+	+	.	.	.	+	.	+	.	+	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.
Mallotus	tetracoccus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.
Mallotus	walkerae	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Mangifera	zeylanica	+	+	+	+	.	.	.	.	+	+	.	+	.	.	.	.	+	+	+	+	.	+	+	.	.	.
Manilkara	hexandra	.	.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Mastixia	arborea	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
*Mastixia	macrophylla	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mastixia	nimali	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mastixia	tetrandra	.	.	+	+	.	.	.	.	+	.	.	+	+	+	+	.	+	+	+	+	+	.	.	.	.	.
*Medinilla	maculata	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Melastoma	malabathricum	+	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	+	.	+	.	+	+	.	.	.
Meliosma	simplicifolia	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	capitellatum	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	clarkeanum	+	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	discolor	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	ellipticum	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	fuscescens	+	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	+	.	.	.	.	+	.	.	.
*Memecylon	grande	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.
*Memecylon	giganteum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	hookeri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.
*Memecylon	macrocarpum	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	macrophyllum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	orbiculare	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	petiolatum	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	procerum	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.
*Memecylon	rhinophyllum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	rivulare	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.
*Memecylon	rostratum	+	.	+	+	.	.	.	.	+	+	.	+	.	.	.	.	+	+	+	+	+	+	+	.	.	.
*Memecylon	sylvaticum	+	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	+	+	+	.	.	.	.
Memecylon	umbellatum	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Memecylon	urceolatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
*Memecylon	varians	.	+	.	+	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Mesua	ferrea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Mesua	pulchela	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.
Mesua	thwaitesii	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	.	.
Microtropis	wallichiana	.	.	.	+	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	+	+	.	.	.	.
Miliusa	indica	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Miliusa	zeylanica	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mimusops	elengi	.	.	.	+	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.
Mischodon	zeylanicus	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mitragyna	parvifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Murraya	koenigii	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mussaenda	frondosa	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.
Mussaenda	glabrata	+	.	+	.	.	.	.	.	.	+	.	+	.	+	.	.	.	+	.	+	.	.	.	.	.	.
Myristica	dactyloides	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
*Nargedia	macrocarpa	.	.	.	+	.	.	.	.	+	.	.	.	.	+	+	.	+	.	+	+	.	.	.	.	.	.
*Neolitsea	cassia	+	+	+	+	.	.	.	.	+	.	.	+	.	.	.	+	+	+	+	+	+	+	+	.	.	.
*Nepenthes	distillatoria	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.
Nephelium	lappaceum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nipa	fruticans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Nothapodytes	foetida	.	.	+	+	.	.	.	.	+	+	.	.	+	+	+	.	.	+	+	+	+	.	+	.	.	.
Nothapodytes	nimmoniana	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nothopegia	beddomei	.	+	+	+	.	.	.	.	+	.	.	.	+	.	+	.	+	.	+	+	+	.	+	.	.	.
*Ochlandra	stridula	.	.	+	+	.	.	.	.	+	+	.	.	.	+	+	+	+	+	+	+	.	.	.	.	.	.
*Ochna	jabotapita	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.
Ochna	lanceolata	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ocimum	gratissimum	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Olax	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.
*Oncosperma	fasciculatum	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	+	+	.	.	.
Opuntia	dillenii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Osbeckia	aspera	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Osmelia	gardneri	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pagiantha	dichotoma	.	+	+	+	.	.	.	.	+	.	.	.	+	.	.	+	+	.	+	.	.	.	+	.	.	.
*Palaquium	canaliculatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
*Palaquium	grande	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.
Palaquium	hinmolpedde	.	+	.	+	.	.	.	.	+	.	.	.	.	+	+	.	+	.	.	.	+	.	.	.	.	.
Palaquium	pauciflorum	+	.	+	+	.	.	.	.	.	+	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.
*Palaquium	petiolare	.	+	+	+	.	.	.	.	+	.	.	+	+	.	+	.	+	+	+	+	.	+	+	.	.	.
Palaquium	rubiginosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Palaquium	thwaitesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Pandanus	thwaitesii	.	+	+	+	.	.	.	.	+	+	.	.	+	+	+	.	+	.	+	+	+	+	+	.	.	.
*Paramignya	armata	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	.
Paramignya	monophylla	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Passiflora	edulis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Pavetta	blanda	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pavetta	indica	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pericopsis	mooniana	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Persea	macrantha	.	+	.	.	.	.	.	.	+	.	.	.	+	.	+	.	+	.	+	.	+	.	.	.	.	.
*Petchia	ceylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Phoenix	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Phoenicanthus	coriacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Phoenicanthus	obliqua	+	+	+	+	.	.	.	.	+	+	.	+	+	+	.	+	.	+	.	.	+	.	+	.	.	.
Phyllanthus	indicus	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phyllanthus	pinnatus	.	.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Phyllanthus	polyphyllus	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Phyllochlamys	taxoides	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Piper	trineuron	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pleiospermium	alatum	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pleurostylia	opposita	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Polyalthia	cerasoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polyalthia	korinti	+	.	+	+	+	.	+	+	+	+	.	+	+	+	.	+	.	+	.	+	+	+	+	.	.	.
Polyalthia	longifolia	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polyalthia	suberosa	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pometia	tomentosa	.	+	+	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.
Pongamia	pinnata	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Premna	latifolia	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Premna	tomentosa	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Prismatomeris	tetrandra	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Prunus	walkeri	.	+	+	+	.	.	.	.	+	.	.	.	+	.	+	.	.	+	.	.	+	.	+	.	.	.
*Pseudocarapa	championii	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.
*Psychotria	dubia	+	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.
*Psychotria	glandulifera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Psychotria	nigra	.	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Psychotria	sarmentosa	.	.	+	.	.	.	.	.	+	.	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	.
*Psychotria	stenophylla	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.
*Psychotria	waasii	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pterospermum	canescens	.	+	.	+	.	.	+	+	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
*Ptychopyxis	thwaitesii	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Putranjiva	zeylanica	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Randia	malabarica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Rapanea	robusta	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Reissantia	indica	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhizophora	mucronata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Rhynchotechum	permolle	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Rinorea	virgata	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rourea	minor	.	.	.	.	.	.	.	.	+	+	.	.	.	+	+	+	.	+	+	.	+	+	+	.	.	.
Salacia	diandra	.	+	+	.	.	.	.	.	+	+	.	.	+	+	+	.	.	.	+	+	.	.	.	.	.	.
Salacia	oblonga	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salacia	reticulata	+	+	+	+	+	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Salvadora	persica	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Samadera	indica	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Sapium	insigne	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sapindus	emarginatus	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saprosma	foetens	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Saprosma	indicum	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	.	.	+	.	.	+	.	.	.
*Saprosma	scabridum	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Sarcocca	zeylanica	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sarcandra	chloranthoides	.	+	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Schefflera	emarginata	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Schefflera	racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Schleichera	oleosa	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Schumacheria	angustifolia	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	+	.	.	.
*Schumacheria	castaneifolia	+	+	+	+	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.
Scleropyrum	pentandrum	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.
*Scolopia	acuminata	+	+	+	+	.	.	.	.	+	+	+	.	+	+	.	.	+	+	+	+	+	+	+	.	.	.
*Scolopia	pusilla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Scutia	myrtina	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Scutinanthe	brunnea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Secamone	emetica	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Securinega	leucopyrus	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Semecarpus	acuminata	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Semecarpus	gardneri	+	+	+	+	.	.	.	.	+	.	.	+	+	.	+	+	+	+	+	+	+	+	+	.	.	.
*Semecarpus	moonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Semecarpus	nigro-viridis	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
*Semecarpus	obovata	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.
*Semecarpus	parvifolia	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.
*Semecarpus	pseudo-emerginatus	+	.	+	+	.	.	.	.	+	+	.	+	+	+	+	.	+	.	+	+	+	.	+	.	.	.
*Semecarpus	pubescens	.	.	.	.	.	.	.	.	+	.	.	+	.	+	.	.	+	.	.	+	.	.	.	.	.	.
*Semecarpus	subpeltata	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.	.
*Semecarpus	walkeri	.	.	+	+	.	.	.	.	+	+	.	+	.	+	+	.	.	+	+	+	+	.	.	.	.	.
*Shorea	disticha	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.
*Shorea	dyeri	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	+	.	.	.
Shorea	hulanidda	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Shorea	lissophylla	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.
*Shorea	oblongifolia	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Shorea	pallescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
*Shorea	stipularis	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.
Smilax	prolifera	.	+	+	+	.	.	.	.	+	.	.	.	+	+	+	.	+	+	+	.	+	+	+	.	.	.
Smilax	zeylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Solanum	pubescens	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sonneratia	caseolaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
*Stemonoporus	acuminatus	.	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.
*Stemonoporus	canaliculatus	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Stemonoporus	kanneliyensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Stemonoporus	reticulatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Stemonoporus	wightii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Stenosiphonium	cordifolium	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Stemonurus	apicalis	+	.	+	.	.	.	.	.	+	+	.	+	+	.	.	.	.	+	+	+	.	+	.	.	.	.
Stemonurus	tetrandrus	.	.	+	+	.	.	.	.	+	+	.	.	+	.	+	.	+	.	+	+	.	.	+	.	.	.
Stephania	japonica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sterculia	balanghas	.	+	.	+	+	+	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Stereospermum	personatum	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Streblus	asper	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Streblus	taxoides	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Strombosia	nana	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	.	.	+	+	+	+	.	+	.	.	.
Strobilanthes	asperrima	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Strobilanthes	paniculata	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Strychnos	cinnamomifolia	+	.	+	+	+	.	.	.	+	+	.	.	.	+	+	+	+	.	+	+	+	+	.	.	.	.
*Strychnos	micrantha	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Strychnos	potatorum	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Suregoda	angustifolia	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	+	+	+	.	.	.
Suregoda	lanceolata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Swietenia	macrophylla	+	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Symplocos	cochinchinensis	.	+	+	+	.	.	.	.	+	.	.	.	+	+	+	+	+	+	+	+	.	+	.	.	.	.
*Symplocos	coronata	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Symplocos	cuneata	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Symplocos	hispidula	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.
Symplocos	macrophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Symplocos	pulchra	.	.	+	+	.	.	.	.	+	.	.	.	.	+	+	.	+	.	.	+	+	.	.	.	.	.
*Syzygium	alubo	+	.	+	+	.	.	.	.	+	+	.	.	+	.	.	.	+	+	.	+	.	+	.	.	.	.
Syzygium	aqueum	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.
*Syzygium	caryophyllatum	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	cordifolium	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Syzygium	cumini	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	cylindricum	.	.	.	+	.	.	.	.	+	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	firmum	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	+	+	.	.	.	.
*Syzygium	gardneri	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.
Syzygium	grande	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Syzygium	hemisphericum	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	lissophyllum	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Syzygium	makul	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	micranthum	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.
*Syzygium	neesianum	+	+	+	+	.	.	.	.	+	+	.	+	.	+	.	.	+	+	+	+	.	+	+	.	.	.
*Syzygium	revolutum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Syzygium	rubicundum	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Syzygium	turbinatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Syzygium	wightianum	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Syzygium	zeylanicum	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Tamarindus	indica	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tarenna	asiatica	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tarenna	flava	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.
Tephrosia	purpurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Terminalia	arjuna	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Terminalia	belerica	.	.	+	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Terminalia	chebula	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Terminalia	parviflora	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	+	+	.	+	.	+	.	.	.	.	.
Tetracera	sarmentosa	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	+	+	+	.	.	.	.	.
Tetrastigma	nilagiricum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.
*Timonius	jambosella	.	.	+	+	.	.	.	.	+	.	.	.	+	+	+	.	.	+	+	+	.	+	+	.	.	.
Toddalia	asiatico	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	.	.	+	.	+	.	.	.	.
Tolypanthus	gardneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Trema	orientale	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.
*Trichadenia	zeylanica	.	+	+	+	.	.	.	.	+	+	.	.	+	+	.	.	+	.	+	.	.	.	.	.	.	.
*Tricalysia	dalzelli	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Tricalysia	erythrospora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Turpinia	malabarica	.	+	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Uncaria	elliptica	.	.	.	+	.	.	.	.	+	+	.	+	+	.	.	+	+	+	+	+	+	+	+	.	.	.
*Urophyllum	ellipticum	.	.	.	+	.	.	.	.	+	.	.	.	+	.	+	.	+	.	+	+	.	.	.	.	.	.
Urophyllum	zeylanicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Uvaria	cordata	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Uvaria	macrocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Uvaria	narum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	+	+	+	.	.	.
*Uvaria	semecarpifolia	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.
*Uvaria	sphenocarpa	+	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.	.
*Vateria	copallifera	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.
*Vatica	affinis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ventilago	gamblei	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.
Ventilago	maderaspatana	.	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Vernonia	arborea	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vitex	altissima	+	+	+	+	.	.	+	+	+	.	+	.	+	.	.	+	.	+	+	+	+	.	+	.	.	.
Walsura	piscidia	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Walsura	trifoliata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wattakaka	volubilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Wendlandia	bicuspidata	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	+	.	+	+	.	.	.
*Willughbeia	cirrhifera	.	.	.	+	.	.	.	.	+	+	.	+	.	.	.	.	.	+	+	.	+	+	.	.	.	.
*Wormia	triquetra	+	+	+	+	.	.	.	.	+	.	.	+	+	+	+	.	+	+	+	+	+	+	+	.	.	.
*Wrightia	angustifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Xanthophyllum	geminiflorum	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	+	.	.	.	.
*Xylopia	championii	+	.	+	.	.	.	.	.	+	+	.	+	.	+	.	.	.	+	.	+	.	+	.	.	.	.
*Xylopia	nigricans	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Xylopia	parvifolia	+	.	+	.	.	.	.	.	+	+	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.
*Zanthoxylum	caudatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Zizyphus	mauritiana	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Zizyphus	napeca	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	+	.	+	.	.	.
Zizyphus	oenoplia	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+

Annex 2

LIST OF SPECIES OF SELECTED GROUPS OF ANIMALS

Endemics are marked by an asterisk. Forests are denoted by their number.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
MAMMALS																											
Axis	axis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
Bandicota	indica	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bubalus	bubalis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Cervus	unicolor	.	.	.	.	.	.	+	+	+	.	.	+	.	.	+	.	+	.	.	.	+	.	+	.	+	+
Elephas	maximus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.
Felis	rubiginosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Funambulus	layardi	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.
Funambulus	palmarum	.	.	.	+	.	+	.	.	+	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.
Funambulus	sublineatus	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Herpestes	fuscus	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.
Herpestes	smithi	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Hystrix	indica	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+
Lepus	nigricollis	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Lutra	lutra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Macaca	sinica	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	+	+	.	+	.
Manis	crassicaudata	+	+	+	+	+	+	+	+	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	+
Megaderma	spasma	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Melurssus	ursinus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Muntiacus	muntjak	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.
Panthera	pardus	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Paradoxurus	hermaphroditus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Paradoxurus	zeylonensis	.	+	.	.	.	.	.	+	+	.	+	+	.	.	+	.	.	.	.	+	+	.	+	.	+	.
Presbytis	entellus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Presbytis	senex	+	+	+	.	.	+	+	+	+	.	+	.	.	.	+	+	.	.	+	+	+	.	+	+	+	.
Ratufa	macroura	.	+	+	.	.	+	+	.	+	+	.	.	.	.	+	+	.	.	.	.	.	.	.	+	+	+
Sus	scrofa	.	+	+	+	.	+	+	+	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	+
Tatera	indica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tragulus	meminna	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.
Viverricula	indica	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BIRDS																											
Accipiter	trivirgatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Acridotheres	tristis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	+	.
Acrocephalus	dumetorum	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Aegithinia	tiphia	.	+	+	+	+	+	+	+	+	+	.	+	+	+	+	+	+	.	.	.	.	+	.	.	+	+
Alauda	gulgula	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Alcedo	atthis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Amaurornis	phoenicurus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anas	querguedula	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Anhinga	melanogaster	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthus	rufulus	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthracoceros	coronatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Apus	affinis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ardea	cinerea	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ardea	purpurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ardeola	grayii	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Arenaria	interpres	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Batrachostomus	moniliger	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bubuleus	ibis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Butorides	striatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cacomantis	passerinus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Caprimulgus	asiaticus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Centropus	chlororhynchus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Centropus	sinensis	.	.	.	.	.	+	.	+	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Ceyx	erithacus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chalcophaps	indica	.	+	.	.	+	+	.	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	+	+	+	+
Chlidonias	hybridus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chloropsis	aurifrons	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	+	.	.
Chloropsis	cochinchinensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chrysocolaptes	lucidus	.	.	+	.	+	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	+
Cicinia	episcopus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Cissa	ornata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Collocalia	unicolor	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Columba	torringtoni	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Copsychus	malabaricus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	+	.	+	.	.
Copsychus	saularis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Coracias	benghalensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Coracina	macei	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Corvus	macrorhynchos	+	.	+	.	.	+	.	.	.	.	.	.	.	.	+	.	.	+	+	+	+	.	.	+	.	.
Corvus	splendens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cuculus	varius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Culicicapa	ceylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cyornis	tickliiae	+	+	.	.	.	.	.	+	+	+	.	+	.	.	+	.	+	.	.	+	.	.	.	.	+	.
Cypsiurus	balasiensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Dendronanthus	indicus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.
Dendrocygna	javanica	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicaeum	erythrorhynchos	.	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.	+	.	+	+	.	+	+	+	+
*Dicaeum	vincens	.	.	.	.	.	.	.	+	+	+	.	+	.	.	+	.	.	.	.	.	+	.	+	.	.	+
Dicrurus	caerulescens	.	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Dicrurus	leucophaeus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicrurus	paradiseus ceylonicus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dinopium	bengalense	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.
Ducula	aenea	.	+	+	.	+	+	.	+	+	+	.	.	.	.	+	.	.	.	.	.	+	.	.	+	+	.
Dumetia	hyperythra	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Egretta	alba	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Egretta	garzetta	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Egretta	intermedia	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Eremopterix	grisea	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eudynamys	scolopacea	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Galloperdix	bicalcarata	+	+	+	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	+	.	+	.	+	+	+	+
*Gallus	lafayettii	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.
*Garrulax	cinereifrons	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gelochelidon	nilotica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glaucidium	castanonetum	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glaucidium	radiatum	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Gracula	ptilogenys	.	+	.	.	.	+	+	+	+	+	+	+	.	.	+	.	.	.	.	.	.	.	+	.	+	+
Gracula	religiosa	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	+	.	.	+	+	.
Haliacetus	leucogaster	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Haloyon	smyrnensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.
Haliastur	indus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Harpactes	faciatus	.	.	.	.	.	.	+	+	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	.
Hemiprocne	coronata	.	+	+	+	+	.	+	+	+	.	.	.	.	+	.	.	+	+	.	+	.	.	+	.	+	+
Hemipus	picatus	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.
Himantopus	himantopus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Hirundo	daurica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hirundo	rustica	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.
Hypothymis	azurea	+	+	+	.	+	+	+	+	+	.	.	+	.	+	+	+	+	.	+	+	+	+	+	.	+	+
Hysipetes	indicus	.	+	+	.	.	.	+	+	+	+	+	+	.	.	+	+	.	.	.	+	+	.	+	+	+	+
Hysipetes	madagascariensis	.	+	+	.	+	.	+	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	+	+	+	+
Ictinaetus	malayensis	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ixobrychus	cinnamomeus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ixobrychus	sinensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Ketupa	zeylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lanius	cristatus	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Limosa	limosa	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Lonchura	punctulata	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Lonchura	striata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Loriculus	beryllinus	+	+	+	.	.	.	+	+	+	+	+	+	.	+	+	+	.	+	.	.	+	.	+	+	+	+
Luscinia	brunnea	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Megalaima	flavifrons	.	+	+	.	.	.	+	+	+	+	+	+	.	.	+	.	.	.	+	+	+	.	+	.	+	+
Megalaima	haemacephala	.	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	+	.	+	+	.	.	+	.
Megalaima	rubricapilla	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	+	+
Megalaima	zeylanica	.	+	+	.	+	+	+	+	+	.	.	.	+	+	.	.	+	+	+	.	.	+	.	.	+	+
Merops	leschenaulti	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Merops	orientalis	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Merops	philippinus	.	.	+	+	+	.	.	+	.	.	+	.	+	+	.	.	+	+	.	+	.	+	.	.	+	+
Mirafra	assamica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Motacilla	cinerea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Muscicapa	latirostris	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Muscicapa	muttui	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.
*Muscicapa	sordida	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mycteria	leucocephala	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Nectarinia	asiatica	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Nectarinia	lotenia	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.
Nectarinia	zeylonica	+	+	+	+	+	+	.	+	+	.	+	.	+	.	+	+	+	+	+	+	.	+	.	+	+	+
Nycticorax	nycticorax	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Oriolus	xanthornus	+	+	+	.	.	+	+	.	.	.	.	+	+	.	.	+	+	.	.	.	+	+	.	+	+	.
Orthotomus	sutorius	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.
Pavo	cristatus	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.
Pelacanus	philippensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Pellorneum	fuscocapillum	.	+	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	+	+	.	+	.	.	.	+	.
Pericrocotus	cinnamomeus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pericrocotus	flammeus	.	+	+	.	+	+	+	+	+	+	+	+	.	.	+	.	.	.	.	.	+	.	.	.	+	+
Phalacrocorax	fuscicollis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phalacrocorax	niger	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Phaenicophaeus	pyrrhocephalus	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phaenicophaeus	viridirostris	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Phodilus	badius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phylloscopus	magnirostris	+	+	.	.	.	+	+	+	+	.	+	.	.	+	.	+	+	+	.	+	+	+	.	+	+	+
Phylloscopus	nitidus	+	+	+	.	+	.	+	+	+	+	+	.	.	+	.	+	+	+	+	+	+	+	.	+	+	+
Picoides	maharattensis	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Picoides	Nanus	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Picus	chlorolophus	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Pitta	brachyura	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.
Ploceus	philippinus	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Pluvialis	squatarola	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pomatorhinus	horsfieldii	.	.	+	.	.	.	+	+	+	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	+	+
Prinia	inornata	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Prinia	socialis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Prinia	sylvatica	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Psittacula	calthropae	.	.	.	.	.	.	.	+	+	.	.	+	.	.	+	.	.	.	.	.	+	.	+	.	.	.
Psittacula	eupatria	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.
Psittacula	krameri	.	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	+	+	.	.	.	+	.	+	.	.
Pycnonotus	cafer	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.
Pycnonotus	luteolus	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.
Pycnonotus	melanicterus	.	+	+	.	+	+	+	+	.	+	.	.	.	+	+	+	+	+	.	.	.	.	+	+	+	+
Rhipidura	aureola	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhopocichla	atriceps	+	.	.	.	.	.	+	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+
Rostratula	benghalensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Saxicoloides	fulicata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sitta	frontalis	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Spilernis	cheela	+	+	+	.	+	+	+	+	+	.	.	+	+	+	.	.	.	.	.	+	+	.	+	+	+	+
Spizaetus	cirrhatus	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Spizaetus	nipalensis	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Streptopelia	chinensis	+	+	.	+	.	.	.	.	+	+	.	.	+	.	.	+	+	.	+	.	+	+	.	+	+	.
Strix	letogrammica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Sturnus	senex	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
Taccocua	leschenaultii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tephrodornis	pondicerianus	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Terpsiphone	paradisi	.	+	+	.	.	.	+	+	+	.	.	.	+	.	.	.	+	.	.	.	+	+	.	+	+	+
Tockus	griseus	.	+	.	.	.	.	+	+	+	.	.	+	.	.	.	+	+	+	.	.	+	.	.	+	+	.
Treron	bicincta	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Treron	pompadora	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	.
Tringa	glareola	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tringa	hypoleucos	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Turdoides	affinis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Turdoides	rufescens	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Turnix	suscitater	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Upupa	epops	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vanelius	indicus	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
*Zoothera	spilotera	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.
*Zosterops	ceylonensis	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Zosterops	palpebrosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
REPTILES																											
*Balanophis	ceylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Boiga	ceylonensis	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Boiga	trigonata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Calotes	calotes	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Calotes	ceylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
*Calotes	liolepis	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calotes	liocephalus	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calotes	versicolor	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ceratophora	species 1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ceratophora	species 2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ceratophora	aspera	.	+	+	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	+	+
*Cercaspis	carinatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Chrysopelea	ornata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cnemaspis	jerdoni	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cnemaspis	kandianus	.	+	+	.	.	+	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.
*Cnemaspis	podihuna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Crocodylus	porosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dendrelaphis	bifernalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Dendrelaphis	caudolineolatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Dendrelaphis	tristis	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dryophis	nasutus	.	+	.	.	.	.	+	+	+	+	+	.	.	+	+	.	.	+	.	.	+	.	+	.	+	.
Dryophis	pulveruentus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Hemidactylus	depressus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hemidactylus	leschenaulti	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hemidactylus	maculatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hypnale	hypnale	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lankascincus	fallax	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Lankascincus	gansi	.	.	.	.	.	.	.	.	.	+	+	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.
*Lankascincus	taprobanensis	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lycodon	striatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Lyriocephalus	scutatus	.	+	.	.	+	.	+	+	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	+	+
Mabuya	brevis	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mabuya	carinata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Mabuya	macularia	.	+	.	.	+	.	.	+	+	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	+	+
*Nessia	burtoni	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Oligodon	sublineatus	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Otocryptis	wiegmanni	+	+	+	.	.	+	+	+	+	+	+	.	.	.	+	.	.	.	.	+	+	.	+	+	+	+
Ptyas	mocosus	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Python	molarus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Riopa	punctata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Sitana	pontiaceriana	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Testudo	elegans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
*Trimerasurus	trignocephalus	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Varanus	bengalensis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	+	.
Varanus	salvator	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
AMPHIBIANS																											
Bufo	species 1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Bufo	atukoralei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Bufo	kelaartii	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bufo	melanostictus	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Ichthyophis	glutinosus	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Limnonectes	corrugata	+	.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+
*Limnonectes	greenii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Limnonectes	limnocharis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
Microhyla	ornata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Nannophrys	ceylonensis	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Nannophrys	guentheri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Occidozyga	cyanophylyctis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.
Philautus	leucorhincus	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Philautus	microtympanum	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Philautus	nasutus	.	+	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Philautus	variabilis	.	.	+	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	+	.	+	+	+	+
*Rana	aurantiaca	.	+	.	.	.	.	+	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
*Rana	gracilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Rana	temporalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Rhacophorus	cruciger	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Rhacophorus	macropus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhacophorus	maculatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Thelderma	schmardanus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tomopterna	breviceps	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
FISHES																											
Acanthocobitis	urophthalmus	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aplocheilus	werneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Belontia	signata	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+
Channa	gachua	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Channa	orientalis	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Danio	pathirana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Garra	ceylonensis	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lepidocephalichthys	jonklaasi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Lepidocephalichthys	thermalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Puntius	bimaculatus	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Puntius	dorsalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.
Puntius	filamentosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Puntius	nigrofaciatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	.
*Puntius	pleurotaenia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Puntius	titteya	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Puntius	vittatus	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rasbora	daniconius	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	+	.	.	.	+	.
*Rasbora	vaterifloris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.
*Rasbora	wilpita	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Schistura	notostigma	.	+	.	.	.	.	+	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+
MOLLUSCS																											
*Acavus	haemastoma	.	.	+	.	.	.	.	+	.	+	+	+	.	+	.	.	.	.	+	.	+	.	+	.	.	+
*Acavus	phoenix	+	+	.	.	.	.	+	+	+	+	+	.	.	.	+	.	.	.	.	+	+	.	+	+	.	+
*Acavus	prosperus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Acavus	roseolabiatus	.	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	.	.	+
*Acavus	superbus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.
Achatina	fulica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Aulopoma	grande	.	+	+	.	+	.	.	.	.	.	.	.	.	+	.	+	+	+	+	.	.	.	.	+	+	.
*Aulopoma	helicinum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Beddomea	trifasciatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Corilla	adamsi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
*Corilla	beddomeae	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
*Cyclophorus	ceylanicus	.	+	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.	+	.	.	.	.	+	+
*Ena	stalix	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euplecta	acuducta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Euplecta	gardneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euplecta	indica	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.
Euplecta	semidecussata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Oligospira	skinneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
*Oligospira	waltoni	.	+	+	.	.	+	+	+	+	.	+	+	.	+	+	.	.	.	.	.	+	.	+	+	+	+
*Philalanka	trifilosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rachis	pulcher	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
*Tortulosa	cumingi	.	.	.	.	.	+	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
*Tortulosa	pyramidata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
BUTTERFLIES																											
Abisara	echerius	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
Anapheis	aurota	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Appias	albina	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.
*Atrophaneura	jophon	.	.	.	.	.	+	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	+	+
Bindahara	phocides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Catopsilia	crocale	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Catopsilia	pomona	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	+
Catopsilia	pyranthe	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Cethosia	nietneri	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chilasa	clytia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cirrochroa	thais	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Colotis	calais	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Colotis	eucharis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Danaus	aglea	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Danaus	chrysippus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Danaus	hamata	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Danaus	limniace	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Delias	eucharis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Euploea	core	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+
Euploea	phaenareta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eurema	hecabe	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Euthalia	aconthea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euthalia	evelina	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Graphium	agamemnon	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	+	.
Graphium	doson	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Graphium	sarpedon	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Huphina	nerissa	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Hypolimnas	bolina	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hypolimnas	misippus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.

Genus	Species	24	37	38	44	60	62	65	69	77	120	129	138	164	173	175	178	186	187	190	201	208	237	253	263	293	303
Idea	lynceus	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Kallima	philarchus	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Leptosia	nina	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Limenitis	procris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Loxura	atymnus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Lxias	marianne	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Lxias	pyrene	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Melanitis	leda	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Melanitis	phedima	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Murwareda	athamas	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Mycalesis	patnia	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Neptis	hylas	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Orsotriaena	medus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Papilio	crino	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Papilio	demoleus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Papilio	helenas	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Papilio	polytes	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Papilio	polymnestor	+	.	+	.	.	.	.	+	+	+	+	.	.	+	+	.	.	.	.	.	+	.	+	.	.	.
Parthenos	sylvia	.	.	.	.	.	.	+	+	+	+	.	+	.	+	+	.	.	.	.	.	.	.	.	.	+	.
Phalanta	phalanta	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polydorus	aristolochiae	.	.	.	+	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	+	.
Polydorus	hector	.	.	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Precis	almana	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Precis	atlites	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Precis	iphita	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
Rapala	manea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Telchinia	violae	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Troides	helena	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.
Valeria	ceylanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Vindula	erota	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ypthima	ceylonica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497
MAMMALS														
Axis	axis	.	.	.	.	+	+	+	+	.	.	.	.	.
Bandicota	indica	.	.	.	.	.	.	.	.	.	.	.	.	.
Bubalus	bubalis	.	.	.	.	+	+	+	.	.	.	.	.	.
Cervus	unicolor	.	.	+	+	+	+	+	+	+	.	+	.	.
Elephas	maximus	.	.	.	.	+	+	+	+	.	.	.	.	.
Felis	rubiginosa	.	.	.	.	.	.	+	.	.	.	.	.	.
Funambulus	layardi	.	.	+	.	.	.	.	.	+	.	.	.	.
Funambulus	palmarum	.	.	.	.	+	+	+	+	.	.	+	.	.
Funambulus	sublineatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Herpestes	fuscus	.	.	.	.	.	.	.	.	.	.	.	.	.
Herpestes	smithi	.	.	.	.	+	+	+	.	.	.	.	.	.
Hystrix	indica	+	+	+	+	+	+	+	.	+	+	+	+	+
Lepus	nigricollis	.	.	.	.	+	+	+	.	.	.	.	.	.
Lutra	lutra	.	.	+	.	.	.	+	+	+	.	.	.	.
*Macaca	sinica	.	.	.	+	.	.	.	.	.	.	+	.	+
Manis	crassicaudata	+	+	+	+	+	+	+	+	+	+	+	+	+
Megaderma	spasma	.	.	.	.	.	.	.	.	.	.	.	.	.
Melurssus	ursinus	.	.	.	.	+	+	+	+	.	.	.	.	.
Muntiacus	muntjak	.	+	.	.	.	.	+	.	+	.	.	.	.
Panthera	pardus	.	.	.	.	+	.	+	+	+	.	.	.	.
Paradoxurus	hermaphroditus	.	.	+	.	+	.	+	.	.	.	.	.	.
*Paradoxurus	zeylonensis	.	.	+	+	.	.	.	.	+	.	.	.	.
Presbytis	entellus	.	.	.	.	+	+	+	.	.	.	.	.	.
*Presbytis	senex	+	+	.	+	+	.	.	.	+	.	.	.	+
Ratufa	macroura	+	+	+	+	.	.	.	.	+	.	+	.	.
Sus	scrofa	+	+	+	+	+	+	+	+	+	+	+	+	.
Tatera	indica	.	.	.	.	+	+	+	.	.	.	.	.	.
Tragulus	meminna	.	.	+	.	+	+	+	.	+	.	.	.	.
Viverricula	indica	.	.	.	.	.	.	+	.	.	.	.	.	.
BIRDS														
Accipiter	trivirgatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Acridotheres	tristis	.	.	.	.	+	.	+	.	.	.	+	.	.
Acrocephalus	dumetorum	.	.	.	.	.	.	.	.	.	.	.	.	.
Aegithinia	tiphia	+	.	.	+	+	+	+	+	+	.	.	.	+
Alauda	gulgula	.	.	.	.	.	.	.	.	.	.	.	.	.
Alcedo	atthis	.	.	.	.	.	.	.	.	.	.	.	.	.
Amaurornis	phoenicurus	.	.	.	.	.	.	.	.	.	.	.	.	.
Anas	querguedula	.	.	.	.	.	.	.	.	.	.	.	.	.
Anhinga	melanogaster	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthus	rufulus	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthracoceros	coronatus	.	.	.	.	+	+	.	+	.	.	.	.	.
Apus	affinis	.	.	.	.	.	.	.	.	.	.	.	.	.
Ardea	cinerea	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	498	499	500	501	505	506	507	508	509	511	523	524	525
MAMMALS														
Axis	axis	.	.	.	.	.	.	.	.	.	.	.	.	.
Bandicota	indica	.	.	.	.	.	.	.	.	.	.	.	.	.
Bubalus	bubalis	.	.	.	.	.	.	.	.	.	.	.	.	.
Cervus	unicolor	+	+	+	.	+	+	.	+	+	+	.	.	.
Elephas	maximus	.	.	.	.	.	+	.	.	.	.	.	.	.
Felis	rubiginosa	.	.	.	.	.	.	.	.	.	.	.	.	.
Funambulus	layardi	.	.	+	.	+	.	+	.	.	.	.	.	.
Funambulus	palmarum	.	.	.	.	.	.	.	.	.	.	.	+	+
Funambulus	sublineatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Herpestes	fuscus	.	.	.	.	.	.	.	.	.	.	.	.	.
Herpestes	smithi	.	.	.	.	.	.	.	.	.	.	.	.	.
Hystrix	indica	+	.	+	+	+	+	+	+	+	+	+	.	.
Lepus	nigricollis	.	.	.	.	.	.	.	.	.	.	.	.	.
Lutra	lutra	.	.	.	.	.	.	.	.	.	.	.	.	.
*Macaca	sinica	.	+	.	.	.	+	.	.	.	.	.	.	.
Manis	crassicaudata	+	+	+	+	+	+	+	+	.	+	+	.	.
Megaderma	spasma	.	.	.	.	.	.	.	.	.	.	.	.	.
Melurssus	ursinus	.	.	.	.	.	.	.	.	.	.	.	.	.
Muntiacus	muntjak	.	.	.	.	.	.	.	.	.	.	.	.	.
Panthera	pardus	.	.	.	.	.	.	.	.	.	.	.	.	.
Paradoxurus	hermaphroditus	.	.	.	+	.	.	.	.	.	.	.	.	.
*Paradoxurus	zeylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.
Presbytis	entellus	.	.	.	.	.	.	.	.	.	.	.	+	.
*Presbytis	senex	+	+	+	+	+	+	+	+	.	.	.	.	.
Ratufa	macroura	.	.	.	+	+	+	.	.	.	+	.	.	.
Sus	scrofa	+	+	+	+	+	+	+	+	+	+	+	.	.
Tatera	indica	.	.	.	.	.	.	.	.	.	.	.	.	.
Tragulus	meminna	.	.	.	+	.	.	.	.	.	.	.	.	.
Viverricula	indica	.	.	.	.	.	.	.	.	.	.	.	.	.
BIRDS														
Accipiter	trivirgatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Acridotheres	tristis	.	.	.	.	.	.	.	.	.	.	.	.	+
Acrocephalus	dumetorum	.	.	.	.	.	.	.	.	.	.	.	.	.
Aegithinia	tiphia	+	.	.	.	.	.	+	.	.	.	.	+	.
Alauda	gulgula	.	.	.	.	.	.	.	.	.	.	.	.	.
Alcedo	atthis	.	.	.	.	.	.	.	.	.	.	.	.	+
Amaurornis	phoenicurus	.	.	.	.	.	.	.	.	.	.	.	.	+
Anas	querguedula	.	.	.	.	.	.	.	.	.	.	.	.	.
Anhinga	melanogaster	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthus	rufulus	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthracoceros	coronatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Apus	affinis	.	.	.	+	.	.	.	.	.	.	.	.	.
Ardea	cinerea	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Ardea	purpurea	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Ardeola	grayii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Arenaria	interpres	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Batrachostomus	moniliger	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bubuleus	ibis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Butorides	striatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Cacomantis	passerinus	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Caprimulgus	asiaticus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Centropus	chlororhynchus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Centropus	sinensis	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.
Ceyx	erithacus	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chalcophaps	indica	.	+	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.
Chlidonias	hybridus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Chloropsis	aurifrons	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Chloropsis	cochinchinensis	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chrysocolaptes	lucidus	.	.	.	+	.	.	.	.	+	+	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.
Cicinia	episcopus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Cissa	ornata	.	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Collocalia	unicolor	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Columba	torringtoni	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Copsychus	malabaricus	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Copsychus	saularis	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Coracias	benghalensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Coracina	macei	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Corvus	macrorhynchos	.	.	.	.	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Corvus	splendens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Cuculus	varius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Culicicapa	ceylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.
Cyornis	ticklliae	+	+	.	+	+	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Cypsiurus	balasiensis	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Dendronanthus	indicus	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dendrocygna	javanica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicaeum	erythrorhynchos	+	+	+	+	.	+	+	+	+	+	+	+	.	+	+	.	.	+	+	+	+	+	.	+	.	.
*Dicaeum	vincens	.	.	.	+	.	.	.	.	+	.	.	.	.	+	+	+	.	+	+	+	+	.	+	.	.	.
Dicrurus	caerulescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
Dicrurus	leucophaeus	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicrurus	paradiseus ceylonicus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Dinopium	bengalense	.	.	.	+	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Ducula	aenea	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Dumetia	hyperythra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Egretta	alba	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Egretta	garzetta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Egretta	intermedia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Eremopterix	grisea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Eudynamys	scolopacea	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Galloperdix	bicalcarata	.	+	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.
*Gallus	lafayettii	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Garrulax	cinereifrons	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gelochelidon	nilotica	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Glaucidium	castanonetum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glaucidium	radiatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Gracula	ptilogenys	.	+	.	+	.	.	.	.	+	+	.	+	.	+	+	.	.	+	.	.	.	+	.	.	.	.
Gracula	religiosa	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Haliacetus	leucogaster	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Haloyon	smyrnensis	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Haliastur	indus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Harpactes	faciatus	.	+	.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.
Hemiprocne	coronata	.	.	.	.	+	+	+	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Hemipus	picatus	.	.	.	.	.	.	+	.	+	.	+	.	.	.	+	+	.	.	+	.	.	+	.	.	.	.
Himantopus	himantopus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hirundo	daurica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Hirundo	rustica	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Hypothymis	azurea	+	+	+	+	+	+	+	+	+	+	.	.	.	+	.	+	.	+	.	.	.	+	.	+	.	.
Hysipetes	indicus	.	+	+	+	.	.	.	.	+	+	.	.	.	+	+	+	+	+	+	+	+	+	+	.	.	.
Hysipetes	madagascariensis	.	+	+	+	.	.	.	.	+	+	.	+	+	+	.	+	.	.	+	+	.	+	+	+	.	.
Ictinaetus	malayensis	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Ixobrychus	cinnamomeus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Ixobrychus	sinensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Ketupa	zeylonensis	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lanius	cristatus	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Limosa	limosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lonchura	punctulata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lonchura	striata	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Loriculus	beryllinus	+	+	+	+	.	.	.	.	+	.	.	+	.	+	.	+	+	+	+	+	+	+	.	.	.	.
Luscinia	brunnea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Megalaima	flavifrons	.	+	+	+	.	.	.	.	+	+	.	.	+	+	+	+	+	+	+	+	+	+	+	+	.	.
Megalaima	haemacephala	.	.	.	+	+	+	+	.	+	.	+	.	.	+	.	.	.	.	.	+	.	+	.	+	.	+
Megalaima	rubricapilla	.	+	+	+	+	+	.	.	+	.	.	.	.	+	.	+	+	+	+	.	.	+	.	.	.	.
Megalaima	zeylanica	.	.	.	.	+	+	+	+	.	.	+	+	.	.	.	.	+	.	.	.	.	.	+	+	+	.
Merops	leschenaulti	.	.	.	+	+	+	+	.	.	.	+	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.
Merops	orientalis	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Merops	philippinus	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	.	.	+	+
Mirafra	assamica	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Motacilla	cinerea	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Muscicapa	latirostris	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Muscicapa	muttui	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
*Muscicapa	sordida	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Mycteria	leucocephala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Nectarinia	asiatica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Nectarinia	lotenia	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Nectarinia	zeylonica	+	.	+	+	+	+	+	+	+	+	+	+	.	.	.	.	.	+	.	.	.	.	+	.	+	+
Nycticorax	nycticorax	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oriolus	xanthornus	+	+	.	.	+	+	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Orthotomus	sutorius	.	.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+
Pavo	cristatus	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Pelacanus	philippensis	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Pellorneum	fuscocapillum	.	.	.	+	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.
Pericrocotus	cinnamomeus	.	.	+	.	+	+	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Pericrocotus	flammeus	.	.	.	.	.	.	.	.	+	.	.	+	.	.	+	+	+	+	+	.	.	.	.	.	.	.
Phalacrocorax	fuscicollis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Phalacrocorax	niger	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Phaenicophaeus	pyrrhocephalus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phaenicophaeus	viridirostris	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phodilus	badius	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phylloscopus	magnirostris	+	+	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.
Phylloscopus	nitidus	+	+	.	+	+	+	+	+	+	+	+	+	+	.	.	.	.	.	.	+	+	+	+	+	.	.
Picoides	maharattensis	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Picoides	Nanus	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Picus	chlorolophus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pitta	brachyura	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ploceus	philippinus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pluvialis	squatarola	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pomatorhinus	horsfieldii	.	+	+	+	.	.	.	+	+	.	.	.	.	+	.	.	.	+	+	+	+	.	+	.	.	.
Prinia	inornata	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Prinia	socialis	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Prinia	sylvatica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Psittacula	calthropae	.	+	.	+	.	.	.	.	+	+	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.
Psittacula	eupatria	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Psittacula	krameri	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Pycnonotus	cafer	.	.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Pycnonotus	luteolus	.	.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Pycnonotus	melanicterus	.	.	+	+	+	.	+	+	+	+	.	.	.	+	.	.	+	.	+	.	+	+	.	+	.	.
Rhipidura	aureola	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhopocichla	atriceps	+	+	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Rostratula	benghalensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Saxicoloides	fulicata	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sitta	frontalis	.	.	.	.	.	.	+	.	+	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.
Spilernis	cheela	+	+	+	.	+	+	.	.	+	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Spizaetus	cirrhatus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Spizaetus	nipalensis	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Streptopelia	chinensis	.	.	.	+	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Strix	letogrammica	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Sturnus	senex	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Taccocua	leschenaultii	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tephrodornis	pondicerianus	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Terpsiphone	paradisi	+	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Tockus	griseus	.	.	+	+	+	.	.	.	+	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.
Treron	bicincta	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Treron	pompadora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Tringa	glareola	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tringa	hypoleucos	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Turdoides	affinis	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Turdoides	rufescens	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Turnix	suscitater	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Upupa	epops	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vanelius	indicus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Zoothera	spilotera	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.
*Zosterops	ceylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.
Zosterops	palpebrosa	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	+	.	.	.	.
REPTILES																											
*Balanophis	ceylonensis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Boiga	ceylonensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Boiga	trigonata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calotes	calotes	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calotes	ceylonensis	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calotes	liolepis	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Calotes	liocephalus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calotes	versicolor	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Ceratophora	species 1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.
*Caratophora	species 2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
*Ceratophora	aspera	.	.	+	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Cercaspis	carinatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chrysopelea	ornata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Cnemaspis	jerdoni	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cnemaspis	kandianus	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
*Cnemaspis	podihuna	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Crocodylus	porosus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dendrelaphis	bifernalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Dendrelaphis	caudolineolatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dendrelaphis	tristis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dryophis	nasutus	.	+	.	+	+	.	.	+	+	.	.	+	+	.	.	.	.	+	+	.	.	.	.	.	.	.
Dryophis	pulveruentus	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Hemidactylus	depressus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hemidactylus	leschenaulti	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hemidactylus	maculatus	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hypnale	hypnale	.	.	.	.	+	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Lankascincus	fallax	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Lankascincus	gansi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
*Lankascincus	taprobanensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lycodon	striatus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lyriocephalus	scutatus	.	+	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.
Mabuya	brevis	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mabuya	carinata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
*Mabuya	macularia	.	+	+	+	+	+	+	.	+	+	+	.	.	+	.	.	+	.	.	+	+	.	+	.	.	.
*Nessia	burtoni	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Oligodon	sublineatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Otocryptis	wiegmanni	+	+	.	+	+	+	+	+	+	+	.	.	.	.	+	+	.	.	.	+	.	.	.	+	.	.
Ptyas	mocosus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Python	molarus	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Riopa	punctata	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sitana	pontiaceriana	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Testudo	elegans	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Trimerasurus	trignocephalus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Varanus	bengalensis	.	.	+	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Varanus	salvator	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
AMPHIBIANS																											
Bufo	species 1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Bufo	atukoralei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
*Bufo	kelaartii	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bufo	melanostictus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
*Ichthyophis	glutinosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Limnonectes	corrugata	+	.	.	+	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.
*Limnonectes	greenii	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Limnonectes	limnocharis	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Microhyla	ornata	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
*Nannophrys	ceylonensis	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
*Nannophrys	guentheri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Occidozyga	cyanophylyctis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Philautus	leucorhincus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Philautus	microtympanum	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Philautus	nasutus	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.
Philautus	variabilis	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.
*Rana	aurantiaca	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Rana	gracilis	.	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Rana	temporalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Rhacophorus	cruciger	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Rhacophorus	macropus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhacophorus	maculatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Thelderma	schmardanus	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tomopterna	breviceps	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
FISHES																											
Acanthocobitis	urophthalmus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aplocheilus	werneri	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Belontia	signata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Channa	gachua	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Channa	orientalis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Danio	pathirana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Garra	ceylonensis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Lepidocephalichthys	jonklaasi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lepidocephalichthys	thermalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
*Puntius	bimaculatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Puntius	dorsalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Puntius	filamentosus	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Puntius	nigrofaciatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Puntius	pleurotaenia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Puntius	titteya	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Puntius	vittatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rasbora	daniconius	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Rasbora	vateriflorис	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Rasbora	wilpita	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Schistura	notostigma	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.
MOLLUSCS																											
*Acavus	haemastoma	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	+	.	+	.	.
*Acavus	phoenix	.	.	+	.	.	.	.	.	+	+	.	.	+	+	.	.	.	.	+	+	.	.	+	.	.	.
*Acavus	prosperus	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.
*Acavus	roseolabiatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Acavus	superbus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Achatina	fulica	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Aulopoma	grande	+	.	.	+	+	.	+	+	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
*Aulopoma	helicinum	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Beddomea	trifasciatus	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Corilla	adamsi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Corilla	beddomeae	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
*Cyclophorus	ceylanicus	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.
*Ena	stalix	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euplecta	acuducta	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Euplecta	gardneri	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euplecta	indica	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.
Euplecta	semidecussata	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Oligospira	skinneri	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.
*Oligospira	waltoni	+	+	.	.	.	.	.	.	+	+	.	.	+	+	.	.	.	.	.	+	+	+	+	+	.	.
*Philalanka	trifilosa	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Rachis	pulcher	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Tortulosa	cumingi	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Tortulosa	pyramidata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BUTTERFLIES																											
Abisara	echerius	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Anapheis	aurota	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Appias	albina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
*Atrophaneura	jophon	+	.	+	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	+	.	+	.	.
Bindahara	phocides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Catopsilia	crocale	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Catopsilia	pomona	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Catopsilia	pyranthe	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cethosia	nietneri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chilasa	clytia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Cirrochroa	thais	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Colotis	calais	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Colotis	eucharis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Danaus	aglea	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Danaus	chrysippus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Danaus	hamata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Danaus	limniace	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oelias	eucharis	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Euploea	core	.	.	.	.	+	+	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Euploea	phaenareta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Eurema	hecabe	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+
Euthalia	aconthea	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euthalia	evelina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Graphium	agamemnon	+	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.
Graphium	doson	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.
Graphium	sarpedon	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Huphina	nerissa	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hypolimnas	bolina	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+
Hypolimnas	misippus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Idea	lynceus	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Kallima	philarchus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Leptosia	nina	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Limenitis	procris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Lcxura	atymnus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lxias	marianne	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lxias	pyrene	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Melanitis	leda	.	.	+	.	+	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Melanitis	phedima	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Murwareda	athamas	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Genus	Species	329	343	369	388	398	399	400	401	414	453	464	471	497	498	499	500	501	505	506	507	508	509	511	523	524	525
Mycalesis	patnia	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Neptis	hylas	.	.	.	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Orsotriaena	medus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Papilio	crino	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Papilio	demoleus	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Papilio	helenas	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.
Papilio	polytes	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Papilio	polymnestor	+	+	.	+	.	.	+	+	+	.	+	.	.	+	+	.	+	+	+	.	.	+	.	.	.	.
Parthenos	sylvia	.	+	+	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	.	+	.	+	.	.
Phalanta	phalanta	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polydorus	aristolochiae	.	+	.	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+
Polydorus	hector	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Precis	almana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Precis	atlites	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Precis	iphita	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rapala	manea	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Telchinia	violae	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Troides	helena	.	+	+	+	.	.	.	.	+	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.
Valeria	ceylanica	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vindula	erota	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Ypthima	ceylonica	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Annex 3

NEW LOCALITY RECORDS OF RARE SPECIES OF WOODY PLANTS IN SOUTHERN PROVINCE

		National Conservation Review			Previous collections					
Species	Fam.	HNo	Locality	Dist.	HNo.	Collector	Locality	Year	Dist.	Observations
Semecarpus obovata	Anac.	6586	Nakiyadeniya	GAL	CP3339	Moon	Kalutara	1820	KAN	Meijer Rev. Flora 4.12
		6782	Auwegalakanda	GAL	CP3339	Thwaites	Ratnapura	1856	GAL	
			Tiboruwakote	GAL	CP3339	Thwaites	Galle Dist.	1861	GAL	
Semecarpus pseudo-emarginatus	Anac.	5883	Masmulla	MTR	CP2677	Thwaites	near Galle	1853	GAL	
		5891	Oliyagankele	MTR						
		5904	Viharekela	MTR						
		6196	Walihena	MTR						
Eugenia glabra	Myrt.	6023	Beraliya	MTR	CP3545	Thwaites	near Galle	1857	GAL	
		6160	Rammalekanda	MTR						
		6201	Walihena	MTR	4142(K)	Worthinpton	Nankitaele		GAL	
		6568	Kanneliya	GAL			[Kanneliya]			
Eugenia fulva	Myrt.	5986	Dediyagala	MTR	CP3008	Thwaites	Morawak Kor	1865	MTR	
		5733	Sinharaja	RAT		Hallapes	Pasdun Kor.		KAL	
		6216	Diyadawa	MTR	a.n.	Trimen	Weligama	1882	MTR	
		6486	Silverkanda	RAT	CP463	Thwaites	Raigam Kor.		KAL	
		6488	Silverkanda	RAT	CP3677	Thwaites	Raigam Kor.		KAL	
					27260	Kostermans	Sinharaja		RAT	
					26712	Kostermans	Sinharaja		RAT	
					28743	Kostermans	Sinharaja		RAT	
Eugenia rufo-fulva	Myrt.	5823	Kekanadura	MTR	CP3835		Raigam Kor.	1867	RAT	"Probably extinct" Kostermans in Quat. J. Taiwan Mus. 34:16
		6042	Baraliya	MTR	CP3835	Thwaites	Getahatta	1853	RAT	
		6590	Nakiyadeniya	GAL	25510	Kostermans	Hinidunkanda		GAL	
		6785	Auwegalakanda	GAL	s.n.	Trimen	Nilowekanda	1882		
		6825	Habarekeda	GAL						
Memecylon hookeri	Melas.	6582	Nakiyadeniya	GAL	CP2686	Thwaites	Ambagamuwa	1853	KAN	
					CP2686	Thwaites	Ambagamuwa	1858	KAN	
		6812	Bambarawana	GAL	a.n.	Ferguson	near Colombo	1863	COL	
					2084	Fagerlind	Galle		GAL	
					4592	Fagerlind	Galle		GAL	
Diospyros acuta	Eben.	6395	Kenneliya	GAL						
		6541	Kanneliya	GAL			unknown	1855		
		6885	Kottawa	GAL			Kanneliya	1976	GAL	
		5863	Badullakela	MTR			Kottawa	1974	GAL	
		5989	Dediyagala	MTR						
Diospyros oppositifolia	Eben.	6555	Kanneliya	GAL	CP3011	Thwaites	Hinidunknda	1853	GAL	

Species	Fam.	HNo	Locality	Dist.	HNo.	Collector	Locality	Year	Dist.	Observations
		6830	Hinidunkande	GAL		Kostermans	Hinidunkande	1974	GAL	
						Jayasuriya	Hinidunkanda	1974	GAL	
						Jayasuriya	Sinharaja	1988	RAT	
Palaquium pauciflorum	Sapot.	6065	Mulatiyana	MTR	CP2680	Thwaites	Ratnapura	1853	GAL	
		6157	Rammalekanda	MTR	CP2680	Thwaites	Ratnapura	1885	GAL	
		6208	Diyadawa	MTR		Trimen	Opata	1881	GAL	
		6289	Dellawa	GAL		?	Tittaweralukota	1919		
		6366	Kanneliya	GAL						
		6597	Nakiyadeniya	GAL	403	Meijer	Gilimale		RAT	
		6768	Homadola	GAL	1456	Wasa	Gilimale		RAT	
		6852	Hindeinattu	GAL						
		7119	Sinharaja	RAT						
Palaquium thwaiteaii	Sapot.	6257	Diyadawa	MTR	CP3679	Thwaites	Kalutara	?	KAL	
					CP3679	Thwaites	Hiniduma	1863	GAL	
					637	Tirvengadum	Hiniduma	1974	GAL	
Madhuca moonii	Sapot.	5864	Badullakele	MTR		Moon	Kalutara	1820?	KAL	
		5976	Dediyagala	MTR	975	Meijer	Kanneliya	1971	GAL	
		5983			3695	Cramer	Hiniduma	1972	GAL	
Croton moonii	Euph.	6548	Kanneliya	GAL	CP577	Moon	Kalutara	1820	KAL	
		6587	Nakiyadeniya	GAL	1304	Wasa	Weligala	1975	KAL	
Rinoraa virgata	Viol.	5720	Medirigiriya	POL	CP1085	Gardner	Minneriya	1848	POL	
		6736	Ruhuna NP	MON			Bintenna	1853	KAN	
							Ooma oya		BAD	
							Atakalan Kor.	1857		
							Lenadora	1888	MTL	
Saleropyrum pentandrum	Santa.	6148	Rammalakanda	MTR	CP2555	Thwaites	Gongala	1853	RAT	
		6259	Diyadawa	MTR	CP2555	Thwaites	Maturata	1857	NEW	
		6313	Dellawa	GAL	1	Jowitt	Avissawella	1893	COL	
		6415	Kalubowitiyana	MTR	1363	Wasa	Diyadawa	1975	MTR	
		6815	Bambarawana	GAL	546	Huber	Heramitigala	1977	RAT	
		6846	Hindeinattu	GAL						
		5797	Dediyagala	MTR						
Byrsphyllum allipticum	Rub.	6026	Beraliya	MTR	CP3482	Thwaites	Hiniduma	1855	GAL	
		6040	Beraliya	MTR						
		6228	Diyadawa	MTR	CP3482	Thwaites	Hiniduma	1859	GAL	
		6378	Kanneliya	GAL	27474	Kostermans	Sinharaja	1979	RAT	
		6561	Kanneliya	GAL						
		6598	Nakiyadeniya	GAL		Jayasuriya	Sinharaja	1986	RAT	
		6615	Malambure	GAL						
		6626	Tawalama	GAL						
		6660	Hinidunkanda	GAL						
		6783	Auwegalakanda	GAL						
		6793	Tibborukota	GAL						
		6901	Kottawa	GAL						
Saporosma indicum	Rub.	5914	Viharekale	MTR	CP82	Gardner	Galagama	1856	RAT	
		5936	Mulatiyana	MTR	s.n.	Trimen	Karawita	1893	RAT	

Species	Fam.	HNo	Locality	Dist.	HNo.	Collector	Locality	Year	Dist.	Observations
		5944								
		6256	Diyadawa	MTR						
Saprosma scabridum	Rub	6614	Malambure	GAL	3306	Thwaites	near Ratnapura	1853	RAT	Only collection since type
Tricalysia erythrospora	Rub	6594	Nakiyadeniya	GAL	2510	Thwaites	Ambagamuwa	1855	KAN	
		5845	Dandeniya-Aparekka	MTR		Trimen	Haputale	1890	BAD	
		6224	Diyadawa	MTR	2880	Jayasuriya	Longford,	1984	RAT	
					2890		Hayes			
					2825	Jayasuriya	Peak Wilderness	1984	KAN	
					3453	Jayasuriya	Kabaragala	1984	NEW	
Miliusa zeylanica	Annon	5950	Mulatiyana	MTR	CP2676	Thwaites	Weligama	1853	GAL	
		5972	Dediyagala	MTR	CP2676	Thwaites	Raigam Kor.	1856	KAL	
						Trimen	Bentota	1887	GAL	
Zanthoxylum caudatum	Rut.	6156	Rammalekanda	MTR	128	Silva	Dotalugala,	19?	RAT	
					156		Eratne			
		6468	Silverkanda	RAT		Jayasuriya	Sinharaja	198?		
		6334	Panilkanda	MTR						
Paramignya armata	Rut.	6458	Kurulugala	MTR	CP1197	Gardner	Elephant Plains	1845		
		6803	Bambarawana	GAL	CP1197	Thwaites	Ambagamuwa	1852	KAN	
					CP1197	Thwaites	Hanguranketa	1855	NEW	
					CP3115	Thwaites	Karawitakand	1863	RAT	
						Trimen	near Ratnapura	1881	RAT	
						Trimen	Ragala	1885	NEW	
						Thornton	N'Eliya	?	NEW	
Medinilla cuneata		5757	Sinharaja	RAT	CP3443	Thwaites	Hewessa	1853	KAL	
		6145	Rammalekanda	MTR	CP3443	Thwaites	Pasdun Kor.	1855	KAL	
					88	Fagerlnd	Sinharaja	197?	RAT	
Caesalpinia crista		7012	Rekawa	HAM	CP	Gardner	Galle	1863	GAL	

NEW LOCALITY RECORDS OF ENDEMIC ANIMAL SPECIES IN SOUTHERN PROVINCE

Scientific name	New localities
Birds	
Centropus chlorohynchus	Nakiyadeniya
Cissa ornata	Panilkanda, Sinharaja (Beverly), Sinharaja (Kosmulla), Kurulugala
Columba toringtoni	Dellawa
Dicaum vixcens	Dellawa, Horagala-Paragala, Panilkanda, Kalubowitiyana, Kurulugala, Habarakada, Kombala-Kottawa, Malambure, Nakiyadeniya, Tawalama, Tiboruwakota, Auwegalakanda
Gracula ptilogenys	Dandeniya-Aparekka, Horagala-Paragala, Mulatiyana, Panilkanda, Viharekele, Rammalakanda, Darukulkanda, Habarakada, Haycock, Malambure, Nakiyadeniya, Hindeinattu
Muscicarpa sordida	Sinharaja (Beverly), Sinharaja (Kosmulla), Panilkanda
Rhalnicophaens pyrrhocephalus	Dellawa, Sinharaja (Beverly), Ruhuna Block 4
Sturnus senex	Diyadawa, Sinharaja (Beverly), Dellawa, Panilkanda, Kurulugala, Kanneliya, Nakiyadeniya
Zosterops ceylonensis	Panilkanda
Reptiles	
Calotes ceylonensis	Kataragama, Ruhuna Blocks 1-4
Calotes liolepis	Dediyagala, Beraliya (Akuressa), Rammalakanda, Panilkanda
Calotes nigrolabis	Panilkanda
Calotes liocephalus	Diyadawa
Ceratophora aspera	Viharekele, Mulatiyana, Dediyagala, Beraliya (Akuressa), Rammalakanda, Dellawa, Silverkanda
Ceratophora sp. 01	Kurulugala, Silverkanda
Ceratophora sp. 02	Silverkanda
Cnemaspis podihuna	Ruhuna Block 4
Lankascincus gansi	Haycock, Habarakada, Kandawattegoda, Kombala-Kottawe, Tiboruwakota
Lankascincus fallax	Ruhuna Blocks 1-2
Lyriocephalus scutatus	Dandeniya-Aparekka, Kirinde Mahayayakele, Viharekele, Mulatiyana, Dediyagala, Beraliya (Akuressa), Dellawa, Panilkanda, Sinharaja (Kosmulla), Haycock, Kombala-Kottawa, Nakiyadeniya, Polgahakanda, Tawalama
Cercapsis carinata	Mulatiyana
Balanopsis ceylonensis	Rammalakanda

Amphibians

Nannophrys ceylonensis	Dellawa, Haycock, Polgahakanda
Nannophrys guntheri	Kanneliya, Dellawa
Philantus microtympanum	Rammalakanda
Limnonectes corrugata	Rammalakanda
Theldesma schmardanus	Rammalakanda

Fishes

Channa orientalis	Rammalakanda
Danio pathirana	Mulatiyana, Kanumuldeniya
Garra ceylonensis	Rammalakanda
Lepdocephalichthys jonklaasi	Kottawa
Rasboro wilpita	Kanneliya

PART D

FUTURE STRATEGY AND PROGRAMME

1. FUTURE STRATEGY AND PROGRAMME TO COMPLETE THE NCR

1.1 INTRODUCTION

The purpose of this part of the document is to review progress achieved by the NCR to date, estimate the amount of time required to finish the fieldwork and identify a strategy which will enable the NCR to be completed within the overall time frame of the Environmental Management in Forestry Developments Project.

It is concerned solely with the biological diversity component of the NCR. The soil conservation and hydrology assessment is a much more rapid procedure, being essentially a desk study supplemented with some field checking. This is evident from the assessment of Southern Province which took a total of four months, including at least one month to develop the methodology (Gunawardena, 1993). It is anticipated that the soil conservation and hydrology component will take a further one year to complete, which is well within the time frame of the NCR.

1.2 REVIEW OF PROGRESS

Field surveys of all remaining natural forests (>= 50 ha) in Galle, Matara and Hambantota districts were completed by the end of 1992. This fieldwork took a total period of 15 months. An additional three months was spent identifying plant and, to a lesser extent, animal specimens collected from the field. Whereas it was originally estimated that Galle and Matara districts would take some eight months to survey (Green, 1991), they have actually taken about one year.

Reference to Table 1 (Part C) shows that a total of 367 plots were sampled in 83 days of fieldwork in the wet zone, and 107 plots in 23 days in the dry zone. This represents rates of 4.4 and 4.7 plots per day in the wet and dry zones, respectively, which is considerably lower than the original estimate of up to 8 plots per day for the wet zone (Green, 1991). Field trips were usually of seven days duration, with five days spent in the field and two days travelling to and from the study area. In practice, two field trips were completed each month.

The NCR is proceeding more slowly than originally expected because much more fieldwork has been necessary than anticipated in the Project Document[1] where it is noted (p. 68) that "A certain amount of field work will be necessary but the Conservation Review must be completed by the end of March 1994." This is due to the following reasons:

- Existing information on the distribution of Sri Lanka's flora and fauna is inadequate, apart from the avifauna for which data have been collected at the level of the national grid (10 x 10 km^2). At best information is patchy, even for some of the better studied forests, such as Sinharaja and Ruhuna (Yala), where surveys have not been comprehensive but restricted to particular parts. Most forests, however, have never even been inventoried.

- In order to identify the most important forests for conservation, each forest needs to be sampled using a standard, systematic methodology. Biological diversity is considered to be one of the most important attributes of forests (p. 64 of Project Document), and this requires a high investment in terms of field work, particularly in the species-rich wet zone where a large number of samples are required to adequately assess species diversity.

- A considerable amount of time is required to identify plant specimens collected from the field. No provisions are made for this in the Project Document.

- As discussed in Part C (Section 1) of this document, it was considered necessary to re-survey the 30

---

[1] *Environmental Management in Forestry Developments. Project Document.* Mission Report SRL/89/012. December 1989.

forests covered by the ACR in order to be able to compare these sites with those of the NCR using the same standard methodology. This decision is proving to be justified: comparisons between the results of the ACR and NCR show that more species are being consistently recorded in the NCR (see Part C, Section 2.6).

Despite the relatively slow progress of the NCR, the gradsect[2] method designed to systematically inventory biological diversity is extremely rapid and cost effective when compared to traditional biological survey methods (see Part A, Section 2.2.1).

1.3 IDENTIFICATION OF REMAINING NATURAL FORESTS TO SURVEY

The *New 1:500,000 Scale Forest Map of Sri Lanka*, produced by the GoSL/UK ODA Forest & Land Use Mapping Project in 1992, provides the basis for identifying areas of remaining natural forest (including mangrove). Copies of this map were provided to the Project reproduced at a scale of 1:100,000. Forests were selected for inclusion in the NCR on the basis of the following criteria:

- any legally designated reserve[3] containing closed canopy natural forest, as defined in the new forest map, irrespective of its size, and

- any other state forest (including proposed reserves) with at least 100 ha[4] of closed canopy natural forest.

Boundaries and the names of forest reserves, together with conservation areas under the jurisdiction of the Department of Wildlife Conservation, have been marked on this map at a scale of 1:100,000. This enables those forests which are notified under either the Forest Ordinance, National Heritage Wilderness Areas Act, or Fauna & Flora Protection Ordinance to be distinguished from proposed reserves and other state forests that lack any legal protection.

Gradsects have been marked on the new forest map, using the 1:63,630 series of topographic maps to align them along altitudinal gradients (i.e. at right angles to contours). In the case of extensive forests, Landsat Thematic Mapper false-colour images (scale 1:50,000) were used to differentiate between community types and ensure that each is sampled.

A comprehensive list of all legally designated reserves is given in Annex 1. Those with closed canopy forest are indicated for inclusion in the NCR in the *status* column, together with any other state forests meeting the above criteria. Based on a sampling rate of 5 plots per day in the wet zone and 6 plots per day in the dry zone, the number of plots and amount of time required to survey each forest has been estimated. The sampling rates used for these estimates are slightly higher than those achieved to date, but they should be attainable in view of the ever increasing field experience of the national consultants.

Table 1 provides a summary of the legal status of forests with respect to their inclusion in the NCR. It should be noted that many legally designated reserves have been excluded from the NCR, some having been converted to plantations or other forms of land use, while a few proposed reserves are below the 100 ha criterion and others (mostly sanctuaries) have never supported forest.

---

[2]A gradsect is a gradient-directed transect.

[3]The term *legally designated reserve* denotes any forest reserve or national heritage wilderness area administered by the Forest Department, and any national reserve or sanctuary administered by the Department of Wildlife Conservation.

[4]A threshold of 50 ha was applied to Galle, Matara and Hambantota districts at the outset of the NCR, but this was later raised to 100 ha to expedite the survey.

Table 1 Number of reserves included and excluded from the NCR, classified by their legal status.

	NHWA*	FR#	PR#	OSF#	NP+	SNR+	NR+	S+
INCLUDED IN NCR								
To survey	1	43	87	139	7	2	1	17
Surveyed	0	19	6	13	4	1	0	4
Subtotal	**1**	**62**	**93**	**152**	**11**	**3**	**1**	**21**
EXCLUDED FROM NCR								
Non forest	0	n/a	n/a	n/a	2	0	0	20
Converted: plantation	n/a	31	33	n/a	n/a	n/a	n/a	n/a
Converted: scrub	0	5	3	n/a	0	0	0	0
Converted: other	0	45	62	n/a	0	0	0	1
Forest < 100 ha	n/a	n/a	9	n/a	n/a	n/a	n/a	n/a
Subtotal	**0**	**81**	**107**	**n/a**	**2**	**0**	**0**	**21**
POLITICALLY INACCESSIBLE TO NCR								
Subtotal	**0**	**34**	**17**	**?**	**11**	**0**	**1**	**16**
TOTALS	**1**	**177**	**217**	**152**	**24**	**3**	**2**	**57**

* National heritage wilderness areas are notified under the National Heritage Wilderness Areas Act, 1988. Only Sinharaja has been notified as such to date.

\# Forest reserves are notified under the Forest Ordinance, 1907 (amended 1966). The Ordinance also provides for other state forests. Proposed reserves are other state forests proposed for reserved forest status.

\+ National parks, strict natural reserves, nature reserves and sanctuaries are notified under the Fauna and Flora Protection Ordinance, 1937 (amended 1970).

1.3.1 Completion of wet zone

Based on the estimates in Annex 1, it is calculated that the remaining districts of the wet zone (comprising lowland rain forest, submontane and montane forest) will take 187 days to survey. This equates to 38 field trips, each of seven days duration, with five days spent in the field and two days travelling. With two field trips completed per month, the total amount of time required to finish surveying the wet zone will be about 20 months (including one month for contingencies). A breakdown for each district is given in Table 2.

It is estimated that an additional four months will be required for identification of plant and animal specimens collected from the field, making a total of two more years to finish the wet zone. The wet zone districts, which comprise 23% of the country, will have taken a total of 3.5 years to survey, including identification of plant and animal specimens. Their completion can be anticipated in March 1995. This is 12 months after the National Conservation Review is scheduled to be completed for the entire country.

1.3.2 Completion of dry zone[5]

Dry zone forests can be surveyed more rapidly than those of the wet zone because their biological diversity is much lower. However, they are more extensive than wet zone forests. The amount of time required to survey

[5] For present purposes the intermediate zone is treated as part of the dry zone because most districts of the intermediate zone also straddle the dry zone.

Table 2 Summary of estimates of the number of transects and plots required to sample species diversity within natural forests for each district in the wet and dry zones, together with the number of days of fieldwork

District	Original area (ha)	Present area[*] (ha)	No forests (km)	No trans.	Length trans.	No plots	No days
SURVEYS COMPLETED: WET ZONE (9.91-12.92)							
Galle	39952	36997	19	32	82	286	41
Matara	13539	12464	16	24	55	224	29
Totals	**53491**	**49461**	**35**	**56**	**137**	**510**	**70**
SURVEYS COMPLETED: DRY ZONE (9.91-12.92							
Hambantota	49844	49553	12	10	18	60	12
Totals	**49844**	**49553**	**12**	**10**	**18**	**60**	**12**
TO SURVEY: WET ZONE							
Colombo	3355	3284	4	5	8	36	7
Gampaha	170	103	1	1	1	5	1
Kalutara	22114	19646	11	14	30	114	22
Kandy	80888	80849	12	23	37	162	32
Kegalla	26877	26869	10	13	33	107	21
Nuwara Eliya	37960	34054	14	21	39	153	30
Ratnapura	45083	42458	54	67	85	375	74
Totals	**216448**	**207265**	**106**	**144**	**233**	**952**	**187**
TO SURVEY: DRY ZONE							
Anuradhapura[#]	93329	91650	25	35	87	231	38
Badulla	68203	68043	12	21	36	122	22
Kurunegala	29098	26346	17	27	39	114	21
Matale	41726	41726	36	45	65	246	48
Monaragala	107023	106952	32	42	111	266	48
Polonnaruwa	73320	71564	14	20	80	158	26
Puttalam	69015	62002	10	12	30	68	16
Totals	**4817161**	**468286**	**146**	**202**	**448**	**1205**	**219**

[*] Accounts for lands released subsequent to their notification as forest reserves or their designation as proposed reserves.
[#] Excludes forests north of Anuradhapura City (8° 21' N) that lie in politically sensitive areas.

politically accessible districts in the dry zone is estimated to be 219 days (Table 2). This equates to 44 field trips spread over a period of 22 months (two trips per month). These districts constitute 48% of the country. It is estimated that an additional two months will be required for identification of plant and animal specimens collected from the field, making a total of two years to complete the dry zone.

It is unlikely that it will be possible to survey forests in the Eastern and Northern provinces (i.e. Amparai, Batticaloa, Jaffna, Kilinochchi, Mannar, Mullaittivu, Trincomalee and Vavuniya districts, which cover 29% of the country) in the foreseeable future due to the prevailing political situation.

1.4 FUTURE STRATEGY

The most appropriate strategy to adopt to ensure that the NCR is completed within the overall time frame of the Environmental Management in Forestry Developments Project (1991-96) and without any break in continuity is considered to be as follows:

- Extend the contracts of the two national consultants (botanist and zoologist) from 30 to 42 months (ending in March 1995) to enable them to complete the wet zone.

- Place a second team of national consultants in the field to survey the dry zone over a two-year period during 1993-95.

- Engage the services of the international consultants responsible for the NCR and Database Development, respectively, to cover the period 1993-96 as appropriate.

Additional funds will be required in order to implement this strategy, and a proposal for a financial extension to the Project has been drafted[6]. This proposal is due to be presented to the Ministry of Lands, Irrigation & Mahaweli Development for endorsement and submission to UNDP. It is anticipated that the proposal will be considered at the forthcoming tripartite meeting in June 1993. **It is imperative that funding be secured in the immediate future to pre-empt any break in continuity, particularly with respect to the fieldwork.**

1.5 FUTURE PROGRAMME

1.5.1 Fieldwork

Fieldwork is continuing on a district-by-district basis, with priority given to the wet zone, ahead of the dry zone, whenever weather conditions permit. The Forest Department attaches great importance to the survey of wet zone forests, and the present moratorium on logging in the wet zone awaits review in the light of the results of the NCR.

There are 14 forests in the wet zone, covering a total area of 259 km^2, that have been earmarked for conservation by the Forest Department in the wake of the ACR. Management plans are due to be prepared for these forests, beginning in mid-1993. Of these 14, eight lie in Southern Province and have already been surveyed by the NCR team. The six outstanding sites are Kalugala in Kalutara District and Bambarabotuwa, Delwela, Gilimale-Eratne, Madampe and Nahiti Mukalana (treated as one site), and Messana in Ratnapura District. It has been agreed that these should be surveyed by May 1993 in order that survey data can be made available for management planning purposes.

---

[6]*Proposal for a financial extension for the Environmental Management Component of the Environmental Management in Forestry Developments Project*. Draft. March 1993. 18 pp.

Thus, forests should be surveyed in the following order of priority:

1. six outstanding wet zone forests designated for conservation,

2. remaining wet zone forests, and

3. dry zone forests.

All forests to be surveyed are indicated in Annex 1 and identified on the set of 1:100,000 maps held by the Project, as previously discussed (Section 1.3).

In order to ensure that the NCR is completed within the times estimated (see Table 2), it is essential that **two field trips of at least seven days duration each be conducted every month** (i.e. alternate weeks should be spent in the field), and that **at least 5 plots be sampled for each day spent in the field in the wet zone and six plots in the case of the dry zone.**

1.5.2 Identification of specimens

There is seldom adequate time between field trips to identify specimens collected on previous trips, particularly plants, and unidentified material quickly accumulates. The backlog of over 1,000 plant specimens collected up to December 1992 took about three months to identify.

From time to time it will be necessary to halt fieldwork in order to catch up on identification work. It is suggested that this be done each time a district is completed, both to avoid the accumulation of large numbers of specimens and to make the fieldwork more efficient by through familiarisation with previously unidentifiable species.

1.5.3 Database management

The ACF/Database Management & Conservation Review is overall responsible for the operation and maintenance of EIMS (Environmental Information Management System), including the entry and checking of data, and regular backing up of the system.

The plant (*PltDat.dbf*) and animal (*AniDat.dbf*) data files currently hold some 23,000 and 7,000 records, respectively. They are already large databases and will become very much larger, by almost an order of magnitude. Considerable care must be taken to ensure that these (and other) databases are properly maintained.

The normal routine for entering fresh data should be as follows:

1. Enter field data into a file having the name of the transect (e.g. *Plt41.dbf*, *Ani52.dbf* etc). This should be done in the \EIMS\CR\DATENT subdirectory.

2. Check the data for duplicate entries, incorrect species codes, or incorrect gradsect and plot numbers using the appropriate programmes.

3. Print out the records and check them against those in the original field form. Make further corrections as necessary and file a hard copy.

4. Append the transect file to the master data file (*Pltdat.dbf* or *AniDat.dbf*).

5. Zip[7] the transect file to ensure that it is not mistakenly appended to the master file a second time. The transect file should not be deleted in case it is ever necessary to refer to this original data file.

---

[7]Zipping is a procedure for compressing files using PKWARE software. Not only is it useful for storing data, but also for protecting data from the possibility of corruption.

1.5.4 Taxonomic lists

A draft check-list of animal species has been generated from the taxonomic subsystem of EIMS and is almost ready for publication. The Forest Department should secure the necessary funds to publish this under the GoSL/UK ODA Forestry Research & Information Project.

A check-list of woody plants is in preparation. Taxonomic names need to checked, updated as necessary (authorities for many species need to be added) and referenced; and the endemic and threatened status of species require further verification. This is an important task which should be completed during 1993.

REFERENCES

Green, M.J.B. (1991). Conservation Review Progress Report (August - October 1991). IUCN/EMD Report No. 7. 24 pp.

Gunawardena, E.R.N. (1993). A report on the importance of natural forests in Galle, Matara and Hambantota districts for soil conservation and hydrology. IUCN/EMD Report No. 15. 19 pp.

Legg, C. and Jewell, N. (1992). A new 1:500,000 scale forest map of Sri Lanka. Forest and Land Use Mapping Project, Forest Department, Colombo. 12 pp.

LIST OF SITES REVIEWED FOR THE NCR

Below is a comprehensive list of all forest reserves, proposed reserves and national heritage wilderness areas administered by the Forest Department, and national reserves and sanctuaries administered by the Department of Wildlife Conservation for all districts except those in the Eastern and Northern provinces. Also listed are all other state forests (OSFs) having a closed canopy area of at least 100 ha.

The status of each forest with respect to its inclusion or exclusion from the NCR is given in the *status* column. Forests were selected for inclusion in the national survey on the basis of the criteria given in Section 1.3, and have been marked on the new forest map of Sri Lanka (Legg and Jewell, 1992), reproduced at a scale of 1:100,000.

Estimates of the number of plots are based on 4 plots per 1 km of transect in the wet zone and 2-4 plots in the dry zone. The absolute minimum number of plots sampled per forest is five.

The number of days of fieldwork required to sample species diversity within each forest is based on the revised sampling estimate of five plots per day in the wet zone and six plots per day in the dry zone, except in the case of Galle and Matara districts which are based on the original estimate of 8 plots per day.

Approximate geographic coordinates of OSFs are given to enable them to be located on the 1:63,360 topographic series of maps. This is not necessary in the case of legally designated reserves because they are clearly marked on these maps.

FOREST			AREA		CONSERVATION REVIEW					LOCATION		
No	Name	Desig-nation	Notified (ha)	Present (ha)	Status'	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
	WET ZONE DISTRICTS											
	COLOMBO											
36	Bellanwila-Attidiya	S	60.0	60.0	E/N	0	0	0	0	COL	6 50	79 54
110	Getamanawa-Dunkolahena	PR	129.7	129.7	E/C	0	0	0	0	COL	-	-
146	Indikada Mukalana	PR	786.1	747.5	I/F	2	2	10	2	COL	-	-
170	Kananpella	FR	295.2	263.5	I/F	1	1	5	1	COL	-	-
222	Labugama-Kalatuwana	FR	2150.1	2150.1	I/F	1	4	16	3	COL KAL RAT	-	-
285	Miriyagalla	FR	123.7	123.1	I/F	1	1	5	1	COL	-	-
419	Sri Jayawardenapura Bird	S	449.2	449.2	E/N	0	0	0	0	COL	-	-
	Totals		3355.1	3284.2	I=4	5	8	36	7			
	GALLE											
8	Ambalangoda-Hikkaduwa Rocky Islets	S	1.3	1.3	E/N	0	0	0	0	GAL	6 9	80 8
509	Auwegalakanda	OSF	250.0	250.0	S/F	2	3	8	1	GAL	-	-
511	Bambarawana	OSF	248.0	248.0	S/F	1	2	8	1	GAL	-	-
37	Beraliya (Akuressa)	PR	1859.9	1645.5	S/F	3	6	24	3	GAL MTR	-	-
38	Beraliya (Kudagala)	PR	4241.1	2571.8	S/F	1	5	16	2	GAL	-	-
62	Darakulkanda	PR	457.6	141.7	S/F	3	3	8	1	GAL	-	-
65	Dediyagala	FR	3789.9	3789.9	S/F	1	6	24	3	GAL MTR	-	-
69	Dellawa	PR	2034.0	2236.3	S/F	3	12	40	5	GAL MTR	-	-
120	Habarakada	PR	209.6	209.6	1/129	0	0	0	0	GAL	-	-
135	Hikkaduwa Marine	S	44.5	44.5	E/N	0	0	0	0	GAL	6 8	80 8
508	Hindeinattu	OSF	200.0	200.0	S/F	2	3	8	1	GAL	-	-
507	Homadola	OSF	300.0	300.0	1/175	0	0	0	0	GAL	-	-
137	Honduwa Island	S	8.0	8.0	E/N	0	0	0	0	GAL	-	-
173	Kandawattegoda	PR	404.7	358.6	I/F	1	2	8	1	GAL	-	-
175	Kanneliya	FR	6114.4	6024.5	S/F	2	10	32	4	GAL	-	-
193	Kelunkanda	FR	249.0	196.3	E/C	0	0	0	0	GAL	-	-
208	Kombala-Kottawa	PR	2289.7	1624.6	I/F	2	5	16	2	GAL	-	-
253	Malambure	FR	1012.3	929.8	S/F	2	5	16	2	GAL	-	-
303	Nakiyadeniya	PR	2292.1	2235.5	S/F	2	5	16	2	GAL	-	-
328	Olabedda	FR	153.6	73.0	E/C	0	0	0	0	GAL	-	-

No	Name	Desig-nation	Notified (ha)	Present (ha)	Status'	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
340	Panagoda	PR	266.3	266.3	D/F	1	2	8	1	GAL	-	-
354	Parapuduwa Nun's Island	S	189.8	189.8	E/N	0	0	0	0	GAL	-	-
369	Polgahakanda	FR	862.3	577.4	I/253	0	0	0	0	GAL	-	-
370	Polgahawila	PR	304.7	286.6	I/F	1	1	4	1	GAL	-	-
372	Polhunnawa	FR	193.0	193.0	E/C	0	0	0	0	GAL	-	-
414	Sinharaja	NHWA	11187.0	11187.0	I/F*	4	10	42	10	GAL MTR RAT	-	-
428	Tawalama	PR	167.5	167.5	D/F	1	1	4	1	GAL	-	-
505	Tawalama	OSF	1000.0	1000.0	S/F	0	0	0	0	GAL	-	-
430	Telwatta	S	1424.5	1424.5	D/M	0	0	0	0	GAL	-	-
506	Tiboruwakota	OSF	600.0	600.0	I/F	1	2	8	1	GAL	-	-
445	Uragaha	PR	1567.3	1567.3	D/F	0	0	0	0	GAL	-	-
510	Yakdehikanda	OSF	100.0	100.0	I/F	1	2	8	1	GAL	-	-
490	Yakkaturwa	FR	296.2	296.2	E/C	0	0	0	0	GAL	-	-
	Totals		39952.7	36997.1	S=19	32	82	286	41			
GAMPAHA												
5	Alawala-Ataudakanda	PR	352.8	352.8	E/C	0	0	0	0	GAM	-	-
26	Bajjangoda	PR	175.9	175.9	E/P	0	0	0	0	GAM	-	-
54	Dambukanda	PR	41.7	41.7	E/C	0	0	0	0	GAM	-	-
125	Halpankanda	PR	159.3	158.5	E/P	0	0	0	0	GAM	-	-
139	Horagolla	S	13.4	13.4	E/N	0	0	0	0	GAM	7 8.1	80 51
181	Karagahatenna	PR	55.4	55.4	E/C	0	0	0	0	GAM	-	-
189	Kebalawita	PR	114.9	114.9	E/P	0	0	0	0	GAM	-	-
212	Kotakanda	PR	254.8	242.7	E/P	0	0	0	0	GAM	-	-
247	Mahakanda	PR	170.6	103.0	I/F	1	1	5	1	GAM	-	-
252	Maimbulkande-Nittambuwa	S	21.8	21.8	E/N	0	0	0	0	GAM	7 8.8	80 54
284	Mirigamkanda	PR	139.3	139.2	E/C	0	0	0	0	GAM	-	-
286	Mitirigala	FR	511.5	353.7	E/C	0	0	0	0	GAM	-	-
457	Walbotalekanda	PR	41.7	41.7	E/P	0	0	0	0	GAM	-	-
477	Wilikulakanda	PR	352.2	310.0	E/C	0	0	0	0	GAM	-	-
	Totals		170.6	103.0	I=1	1	1	5	1			
KALUTARA												
20	Badagama	PR	24.7	24.7	E/C	0	0	0	0	KAL	-	-
516	Boralugoda	OSF	100.0	100.0	I/F	1	1	5	1	KAL	6 25	80 17
42	Botale	PR	276.1	276.1	E/C	0	0	0	0	KAL	-	-
70	Delmella Yatagampitiya	PR	2033.7	1413.3	I/F	1	1	5	1	KAL	-	-
76	Diwalakada	PR	281.1	144.3	E/C	0	0	0	0	KAL	-	-
129	Haycock	FR	362.0	362.0	S/F	0	0	0	0	KAL	-	-
147	Ingiriya	FR	407.0	282.6	I/F	1	1	5	1	KAL	-	-
162	Kaharagala	PR	31.8	31.8	E/C	0	0	0	0	KAL	-	-
166	Kalugala	PR	4630.1	4288.0	I/F	2	5	15	3	KAL	-	-
200	Kirigala Mukalana	PR	18.8	18.8	E/F	0	0	0	0	KAL	-	-
215	Kudaganga	FR	141.3	137.4	E/C	0	0	0	0	KAL	-	-
221	Kurana Madakada	PR	1391.2	1161.4	I/F	2	3	15	3	KAL	-	-
224	Latpandura	PR	42.1	42.1	E/C	0	0	0	0	KAL	-	-
244	Mahagama	FR	368.7	227.1	E/C	0	0	0	0	KAL	-	-
269	Meegahatenna	PR	282.8	277.4	I/F	1	1	5	1	KAL	-	-
289	Morapitiya-Runakanda	PR	7012.5	6732.5	I/F	2	6	18	3	KAL	-	-
297	Nahalla	PR	35.1	35.1	E/C	0	0	0	0	KAL	-	-
315	Neluketiya Mukalana	PR	2625.2	2384.4	I/F	1	5	16	3	KAL	-	-
363	Pelawatta	FR	110.0	110.0	E/C	0	0	0	0	KAL	-	-
367	Plenda West	PR	145.3	145.3	E/C	0	0	0	0	KAL	-	-
368	Polawattakanda	FR	29.4	0.3	E/C	0	0	0	0	KAL	-	-
390	Ranwaragalakanda	PR	192.1	192.1	I/F	1	1	5	1	KAL	-	-
512	Vellihallure	OSF	425.0	425.0	I/F	1	2	10	2	KAL	6 26	80 8
454	Wagawatta	PR	143.3	113.0	E/C	0	0	0	0	KAL	-	-
486	Yagirala	PR	34.1	34.1	E/C	0	0	0	0	KAL	-	-
487	Yagirala	FR	3014.7	2390.2	I/F	1	4	15	3	KAL	-	-
	Totals		22114.3	19646.9	I=11	14	30	114	22			
KANDY												
25	Bahirawakanda	OSF	3.2	3.2	???	0	0	0	0	KAN	-	-
45	Campbell's Land	FR	292.6	292.6	I/F	1	1	5	1	KAN MTL	-	-
79	Dotalugala	PR	1871.7	1871.7	I/522	0	0	0	0	KAN MTL	-	-
100	Galaha	PR	242.8	242.8	I/F	1	1	5	1	KAN	-	-
519	Guruyalle	OSF	175.0	175.0	I/F	1	1	5	1	KAN	7 20	80 58
518	Hopewell	OSF	125.0	125.0	I/F	1	1	5	1	KAN	7 15	80 37

No	Name	Desig-nation	Notified (ha)	Present (ha)	Status'	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
520	Ilhukkanda	OSF	3900.0	3900.0	I/F	4	4	16	3	KAN	7 27	80 55
192	Kelani Valley	PR	2944.9	2906.2	I/F	3	5	25	5	KAN	-	-
522	Knuckles	OSF	30000.0	30000.0	I/F	6	15	60	12	KAN	7 24	80 48
260	Maoye Ella	FR	48.6	48.6	E/C	0	0	0	0	KAN	-	-
517	Matinapatana	OSF	250.0	250.0	I/F	1	1	5	1	KAN	7 16	80 39
394	Rilagala	PR	566.6	566.6	I/F	1	2	10	2	KAN NUW	-	-
441	Udawattakele	FR	104.0	103.0	I/442	0	0	0	0	KAN	-	-
442	Udawattakele	S	104.0	104.0	I/F	1	1	5	1	KAN	7 19	80 39
452	Victoria-Randenigala-Rantambe	S	42087.1	42087.1	I/F	2	4	16	3	KAN NUW	7 14	80 50
472	Welikanda	PR	242.0	43.1	E/P	0	0	0	0	KAN	-	-
521	Wewegalatana	OSF	200.0	200.0	I/F	1	1	5	1	KAN	7 16	80 50
495	Yatale	PR	56.9	56.9	E/C	0	0	0	0	KAN KUR	-	-
	Totals		80888.0	80849.3	I=12	23	37	162	32			
	KEGALLA											
4	Alapalawala	PR	182.1	181.7	I/F	1	1	5	1	KEG	-	-
7	Amanawala-Ampane	PR	518.0	514.0	I/F	1	2	10	2	KEG	-	-
18	Aturupana	FR	24.8	24.8	E/P	0	0	0	0	KEG	-	-
23	Badullawala	PR	42.9	41.0	E/C	0	0	0	0	KEG	-	-
513	Batahena	OSF	300.0	300.0	I/F	1	2	10	2	KEG	6 58	80 26
55	Dambulla	FR	172.3	169.5	E/P	0	0	0	0	KEG	-	-
64	Debetgama Bossella	PR	103.2	103.2	E/C	0	0	0	0	KEG	-	-
515	Dedugalla-Nangala	OSF	275.0	275.0	I/F	1	3	10	2	KEG	7 5	80 25
85	Ehuwana	PR	28.3	28.3	I/?	0	0	0	0	KEG	-	-
86	Ehuwana	FR	85.6	85.6	E/C	0	0	0	0	KEG	-	-
87	Epilagala	PR	42.5	42.5	E/C	0	0	0	0	KEG	-	-
88	Erabaduwala	PR	17.4	17.4	E/C	0	0	0	0	KEG	-	-
108	Gangekumbura	FR	156.4	156.3	E/P	0	0	0	0	KEG	-	-
114	Godagandenikanda	PR	55.8	55.8	E/P	0	0	0	0	KEG	-	-
117	Gondenikanda	FR	73.0	72.4	E/P	0	0	0	0	KEG	-	-
124	Halagiriya	FR	40.5	18.1	E/P	0	0	0	0	KEG	-	-
141	Humpitikanda	PR	36.4	19.4	E/C	0	0	0	0	KEG	-	-
143	Imbulpitiya	FR	12.2	12.2	E/C	0	0	0	0	KEG	-	-
188	Kegalle	S	113.3	113.3	E/N	0	0	0	0	KEG	-	-
191	Kelani Valley	FR	1155.1	1155.1	I/F	2	3	15	3	KEG	-	-
196	Ketangilla	PR	86.2	86.2	I/?	0	0	0	0	KEG	-	-
203	Kitulgala	PR	265.9	263.0	E/C	0	0	0	0	KEG	-	-
204	Kivulpona	FR	21.6	21.6	E/C	0	0	0	0	KEG	-	-
211	Kotagama	FR	29.5	29.5	E/P	0	0	0	0	KEG	-	-
225	Lenagala	FR	33.8	30.0	I/F	1	1	5	1	KEG	-	-
226	Lewala	FR	31.7	30.0	E/C	0	0	0	0	KEG	-	-
258	Maniyangama-Timbiripola	FR	209.0	209.0	E/C	0	0	0	0	KEG	-	-
304	Namalgomuwa	PR	72.8	72.8	E/P	0	0	0	0	KEG	-	-
308	Naranbedda	FR	51.7	51.7	E/P	0	0	0	0	KEG	-	-
316	Netiyapana	FR	18.0	2.2	E/C	0	0	0	0	KEG	-	-
351	Paradeniya	FR	31.2	31.2	E/S	0	0	0	0	KEG	-	-
356	Paspolakanda	PR	112.5	107.4	E/P	0	0	0	0	KEG	-	-
359	Peak Wilderness	PR	5665.7	5665.7	I/361	0	0	0	0	KEG NUW	-	-
361	Peak Wilderness	S	22379.2	22379.2	I/F	3	16	27	5	KEG NUW RAT	6 49	80 37
514	Sembawatte	OSF	1200.0	1200.0	I/F	1	2	10	2	KEG	7 2	80 26
416	Siyambalangamuwa	FR	63.7	63.3	E/C	0	0	0	0	KEG	-	-
427	Taranagala	FR	28.3	28.3	E/C	0	0	0	0	KEG	-	-
551	Usgala	OSF	700.0	700.0	I/F	1	2	10	2	KEG	6 53	80 26
469	Welhella-Ketagille	S	134.2	134.2	I/F	1	1	5	1	KEG	-	-
470	Welhella-Ketangilla	FR	128.8	114.6	I/469	0	0	0	0	KEG	-	-
494	Yalapitiya	PR	43.3	43.3	E/C	0	0	0	0	KEG	-	-
	Totals		26877.4	26869.2	I=10	13	33	107	21			
	MATARA											
501	Aninkanda	OSF	75.0	75.0	I/343	0	0	0	0	MTR	-	-
24	Badullakele	FR	182.3	147.7	S/F	1	1	4	1	MTR	-	-
60	Dandeniya-Aparekka	FR	560.0	348.3	S/F	1	3	12	2	MTR	-	-
500	Derangala	OSF	50.0	50.0	S/F	1	1	4	1	MTR	-	-
77	Diyadawa	FR	2578.2	2447.7	S/F	3	7	28	3	MTR	-	-
104	Gallendakuttiya	FR	89.3	89.1	E/S	0	0	0	0	MTR	-	-
138	Horagala-Paragala	OSF	1800.0	1800.0	S/F	1	6	24	3	MTR	-	-
497	Kalubowitiyana	OSF	100.0	100.0	S/F	1	1	4	1	MTR	-	-
168	Kalugalkanda	FR	62.5	62.5	I/F	1	1	4	1	MTR	-	-
190	Kekanadura	FR	401.7	379.9	S/F	1	2	8	1	MTR	-	-

No	Name	Designation	Notified (ha)	Present (ha)	Status'	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long
201	Kirinda Mahayayakele	FR	374.1	252.7	S/F	1	2	8	1	MTR	-	-
214	Kudagalkanda	FR	151.8	25.7	D/F	1	1	4	1	MTR	-	-
498	Kurulugala	OSF	175.0	175.0	S/F	1	2	8	1	MTR	-	-
263	Masmullekele	FR	805.4	618.0	S/F	1	4	16	2	MTR	-	-
293	Mulatiyana	FR	3277.5	3148.9	S/F	4	10	40	4	MTR	-	-
329	Oliyagankele	FR	488.6	486.0	S/F	1	1	8	1	MTR	-	-
343	Panilkanda	FR	588.1	588.1	S/F	3	5	20	2	MTR	-	-
387	Rammalakanda	PR	4.8	4.8	I/388	0	0	0	0	MTR	-	-
499	Silverkanda	OSF	1000.0	1000.0	S/F	2	4	16	2	MTR	-	-
453	Viharekele	FR	825.1	625.1	S/F	1	3	12	2	MTR	-	-
471	Welihena	FR	333.1	296.8	S/F	1	3	12	2	MTR	-	-
474	Wellana	FR	85.4	85.4	E/S	0	0	0	0	MTR	-	-
	Totals		13539.1	12464.2	S=16	24	55	224	29			
NUWARA ELIYA												
1	Agra-Bopats	PR	9105.4	6933.6	I/F	2	8	22	4	NUW	-	-
9	Ambaliyadde	PR	61.7	61.7	E/P	0	0	0	0	NUW	-	-
40	Bogawantalawa	PR	4289.7	4289.7	I/F	1	3	10	2	NUW	-	-
52	Conical Hill	PR	1569.5	707.5	I/F	2	3	10	2	NUW	-	-
53	Dambakele	FR	71.2	71.2	I/F	1	1	5	1	NUW	-	-
105	Galpalama	PR	73.6	68.0	E/C	0	0	0	0	NUW	-	-
106	Galway's Land	PR	56.7	56.7	I/107	0	0	0	0	NUW	-	-
107	Galway's Land	S	56.7	56.7	I/?	1	1	5	1	NUW	-	-
128	Harasbedda	PR	364.2	364.2	I/F	1	1	5	1	NUW	-	-
140	Horton Plains	NP	3159.8	3159.8	I/F	1	6	20	4	NUW	6 48.5	80 48
171	Kandapola Sita Eliya	PR	109.6	97.9	E/F	0	0	0	0	NUW	-	-
172	Kandapola Sita Eliya	FR	2721.2	2615.9	I/F	1	1	5	1	NUW	-	-
197	Kikilimana	PR	4868.4	4580.6	I/F	3	4	16	3	NUW	-	-
248	Mahakudagala	PR	1762.5	1638.7	I/F	1	2	10	2	NUW	-	-
270	Meepilimana	FR	981.8	771.5	I/F	1	1	5	1	NUW	-	-
307	Nanu Oya	FR	420.8	415.9	I/F	1	1	5	1	NUW	-	-
331	Ottery-Queenswood	PR	52.6	52.6	E/C	0	0	0	0	NUW	-	-
346	Pannala	PR	1173.7	769.1	I/452	0	0	0	0	NUW	-	-
358	Pattipola-Ambawela	PR	1498.0	1480.3	I/F	2	2	10	2	NUW	-	-
362	Pedro	PR	6879.7	6757.0	I/F	3	5	25	5	NUW	-	-
378	Preston-Elsmere	PR	60.7	60.7	E/F	0	0	0	0	NUW	-	-
383	Ragalla	PR	268.1	268.1	I/F	1	1	5	1	NUW	-	-
	Totals		37960.3	34054.0	I=14	21	39	153	30			
RATNAPURA												
549	Alutwelawisahena	OSF	800.0	800.0	I/F	1	1	5	1	RAT	6 43	80 36
527	Angamana	OSF	175.0	175.0	I/F	1	1	5	1	RAT	6 41	80 26
530	Appalagala	OSF	200.0	200.0	I/F	1	1	5	1	RAT	6 43	80 45
528	Asantanakanda	OSF	800.0	800.0	I/F	1	2	10	2	RAT	6 38	80 36
19	Ayagama	PR	661.7	214.3	I/F	1	1	5	1	RAT	-	-
28	Bambaraboturwa	FR	5440.3	5440.3	I/F	3	3	15	3	RAT	-	-
41	Boranjamuwa	OSF	70.8	70.8	n/a	0	0	0	0	RAT	-	-
57	Dambuluwana	FR	485.2	401.1	I/F	1	1	5	1	RAT	-	-
68	Delgoda	PR	998.0	998.0	I/F	1	2	6	1	RAT	-	-
71	Delwela	PR	1560.9	1560.1	I/F	1	2	10	2	RAT	-	-
72	Demanagammana	PR	114.9	114.1	I/F	1	1	5	1	RAT	-	-
542	Digandala	OSF	100.0	100.0	I/F	1	1	5	1	RAT	6 30	80 33
529	Dotalugala	OSF	175.0	175.0	I/F	1	1	5	1	RAT	6 41	80 36
548	Dumbara	OSF	100.0	100.0	I/F	1	1	5	1	RAT	6 41	80 16
91	Etabedda	FR	91.1	70.8	E/C	0	0	0	0	RAT	-	-
540	Galbokaya	OSF	175.0	175.0	I/F	1	1	6	1	RAT	6 26	80 45
538	Gallegodahinna	OSF	200.0	200.0	I/F	1	2	6	1	RAT	6 34	80 46
534	Galleletota	OSF	325.0	325.0	I/F	1	2	6	1	RAT	6 38	80 50
112	Gilimale-Eratne	PR	5832.7	4838.8	I/F	4	7	20	4	RAT	-	-
546	Googala	OSF	1600.0	1600.0	I/F	1	2	8	2	RAT	6 23	80 39
544	Gorangala	OSF	400.0	400.0	I/F	2	2	10	2	RAT	6 29	80 23
545	Handapan Ella	OSF	3600.0	3600.0	I/F	1	3	10	2	RAT	6 26	80 36
543	Handuwelkanda	OSF	150.0	150.0	I/F	1	1	5	1	RAT	6 30	80 25
536	Hapugala	OSF	600.0	600.0	I/F	1	1	5	1	RAT	6 36	80 49
539	Hataramune	OSF	200.0	200.0	I/F	1	2	5	1	RAT	6 34	80 47
130	Helapandeniya	PR	136.0	21.4	E/F	0	0	0	0	RAT	-	-
134	Hidellana	FR	48.6	48.6	E/C	0	0	0	0	RAT	-	-
133	Hidellana-Weralupe	PR	136.8	128.1	I/F	1	1	5	1	RAT	-	-
153	Iriyagahahena	PR	44.5	44.5	E/C	0	0	0	0	RAT	-	-
154	Iriyagahahena Mukalana	FR	74.5	44.1	I/F	1	1	5	1	RAT	-	-

No	Name	Desig-nation	Notified (ha)	Present (ha)	Status*	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
541	Kabarakalapatana	OSF	675.0	675.0	I/F	1	2	10	2	RAT	6 28	80 34
182	Karandana	FR	77.8	77.8	E/C	0	0	0	0	RAT	-	-
184	Karawita	PR	1375.9	1211.8	I/F	3	3	15	3	RAT	-	-
550	Kiribatgala	OSF	300.0	300.0	I/F	1	1	5	1	RAT	6 37	80 31
205	Kobahadunkanda	PR	890.3	890.3	I/F	1	1	5	1	RAT	-	-
531	Kudagoda	OSF	650.0	650.0	I/F	1	2	8	2	RAT	6 43	80 48
217	Kudumiriya	PR	2144.8	2144.8	I/F	1	2	10	2	RAT	-	-
169	Kumburugamuwa	FR	1523.2	1480.7	I/F	1	1	5	1	RAT	-	-
535	Kuragala	OSF	325.0	325.0	I/F	2	2	6	1	RAT	6 38	80 52
233	Madampe	PR	40.5	40.5	I/234	0	0	0	0	RAT	-	-
234	Madampe	FR	237.3	224.8	I/F	1	1	6	1	RAT	-	-
241	Magurugoda	FR	275.4	241.0	I/F	1	1	5	1	RAT	-	-
242	Magurugoda	PR	45.7	24.7	E/F	0	0	0	0	RAT	-	-
272	Marakele	PR	131.5	106.2	I/F	1	1	5	1	RAT	-	-
273	Marakele	FR	76.9	76.9	E/C	0	0	0	0	RAT	-	-
262	Masimbula	FR	20.2	20.2	E/C	0	0	0	0	RAT	-	-
504	Masimbula	PR	255.0	255.0	I/F	1	1	5	1	RAT	-	-
274	Messana	PR	724.4	433.8	I/F	1	2	10	2	RAT	-	-
288	Morahela	FR	930.5	846.9	I/F	1	1	5	1	RAT	-	-
292	Mudunkoturwa	PR	78.1	78.1	E/C	0	0	0	0	RAT	-	-
533	Mulgama	OSF	200.0	200.0	I/F	1	1	5	1	RAT	6 39	80 49
294	Muwagankanda	FR	164.8	132.1	I/F	1	1	5	1	RAT	-	-
298	Nahiti Mukalana	FR	195.7	195.7	I/F	1	1	5	1	RAT	-	-
537	Narangattahinna	OSF	250.0	250.0	I/F	2	2	6	1	RAT	6 35	80 46
339	Pallepattu	FR	680.9	657.9	E/C	0	0	0	0	RAT	-	-
348	Pannala	FR	129.9	129.0	I/F	1	1	5	1	RAT	-	-
547	Paragala	OSF	900.0	900.0	I/F	1	2	10	2	RAT	6 35	80 19
384	Rajawaka	PR	2387.6	2387.6	I/F	3	3	15	3	RAT	-	-
386	Rammalakanda	PR	453.7	453.7	I/F	1	1	5	1	RAT	-	-
389	Ranwala	PR	1117.7	867.5	I/F	1	1	6	1	RAT	-	-
391	Rathkarawwa	PR	4050.5	4021.4	E/P	0	0	0	0	RAT	-	-
421	Talagahakanda	FR	60.4	60.4	E/C	0	0	0	0	RAT	-	-
532	Talawegoda	OSF	450.0	450.0	I/F	1	1	5	1	RAT	6 39	80 47
424	Tandikele	PR	370.3	290.2	E/C	0	0	0	0	RAT	-	-
432	Tibbutukanda	PR	233.9	233.9	I/F	1	1	5	1	RAT	-	-
443	Ulinduwewa	FR	104.7	104.7	I/F	1	1	5	1	RAT	-	-
455	Walankanda	FR	832.9	711.5	I/F	1	1	5	1	RAT	-	-
456	Walawe Basin	FR	3237.5	3229.7	I/361	0	0	0	0	RAT	-	-
459	Waratalgoda	PR	1889.9	1889.9	I/F	2	3	11	2	RAT	-	-
476	Wewelkandura	PR	429.0	429.0	I/F	1	1	5	1	RAT	-	-
	Totals		45083.1	42458.8	I=54	67	85	375	74			

No	Name	Desig-nation	Notified (ha)	Present (ha)	Status[a]	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.

DRY ZONE DISTRICTS

No	Name	Desig-nation	Notified (ha)	Present (ha)	Status	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
ANURADHAPURA												
6	Ahutabendawewa	PR	440.2	384.0	E/F	0	0	0	0	ANU	-	-
11	Anaolundewa	PR	29640.2	28957.1	I/F	2	10	24	4	ANU POL	-	-
637	Andarawewa	OSF	400.0	400.0	I/F	1	2	6	1	ANU	8 17	80 17
14	Anuradhapura	S	3500.7	3500.7	E/N	0	0	0	0	ANU	-	-
636	Aruwewa	OSF	150.0	150.0	I/F	1	2	6	1	ANU	8 14	80 34
631	Dematawewa	OSF	800.0	800.0	I/F	1	2	7	1	ANU	8 7	80 41
92	Etakaduwa	PR	7689.0	7689.0	P/F	0	0	0	0	ANU	-	-
641	Galkulama Tirrapane	OSF	450.0	450.0	I/F	1	3	7	1	ANU	8 18	80 34
642	Galmaduwa	OSF	250.0	250.0	I/F	1	2	6	1	ANU	8 20	80 33
640	Getalagamakanda	OSF	700.0	700.0	I/F	1	2	6	1	ANU	8 15	80 31
136	Hinna	PR	1021.8	1021.8	E/C	0	0	0	0	ANU	-	-
142	Hurulu	FR	25511.1	25217.7	I/F	4	12	30	5	ANU POL	-	-
155	Isaenbessawewa	FR	441.9	441.9	I/F	1	3	6	1	ANU	-	-
159	Kahalla	PR	34.0	34.0	I/161	0	0	0	0	ANU	-	-
160	Kahalla	FR	3397.7	3292.5	I/161	0	0	0	0	ANU	-	-
161	Kahalla-Pallekele	S	21690.0	21690.0	I/F	5	14	30	5	ANU KUR	-	-
639	Katupotakanda	OSF	175.0	175.0	I/F	1	2	6	1	ANU	8 20	80 31
633	Labunoruwa	OSF	300.0	300.0	I/F	1	2	6	1	ANU	8 10	80 38
228	Likolawewa	FR	325.7	325.7	E/C	0	0	0	0	ANU	-	-
230	Lunu Oya	FR	3647.4	3647.4	E/C	0	0	0	0	ANU	-	-
246	Mahakanadarawa Wewa	S	0.0	0.0	E/N	0	0	0	0	ANU	-	-
635	Manawewakanda	OSF	325.0	325.0	I/F	1	1	6	1	ANU	8 8	80 32
643	Marasinhagama	OSF	100.0	100.0	I/F	1	2	6	1	ANU	8 20	80 36
646	Medalassa Korale	OSF	175.0	175.0	I/F	1	2	6	1	ANU	8 0	80 27
267	Medawachchiya	PR	2892.5	2878.4	E/S	0	0	0	0	ANU	-	-
277	Mihintale	FR	3308.2	2462.9	E/P	0	0	0	0	ANU	-	-
278	Mihintale	S	999.6	999.6	I/F	1	1	6	1	ANU	-	-
326	Nuwaragam	FR	2584.8	2314.6	E/P	0	0	0	0	ANU	-	-
332	Padaviya Tank	S	6475.0	6475.0	E/N	0	0	0	0	ANU	-	-
333	Padawiya	PR	97901.7	97664.3	P/F	0	0	0	0	ANU	-	-
638	Pahala Mawatawewa	OSF	325.0	325.0	I/F	1	2	6	1	ANU	8 13	80 30
645	Puliyamkulam	OSF	125.0	125.0	I/F	1	2	6	1	ANU	8 18	80 41
634	Puliyankulama	OSF	150.0	150.0	I/F	1	1	6	1	ANU	8 9	80 34
647	Ranawekanda	OSF	575.0	575.0	I/F	1	2	6	1	ANU	7 55	80 35
632	Ratmale Kanda	OSF	700.0	700.0	I/F	1	3	7	1	ANU	8 1	80 39
395	Ritigala	SNR	1528.2	1528.2	I/F	1	5	12	2	ANU	8 7	80 39
644	Tambaragalawewa	OSF	350.0	350.0	I/F	2	2	6	1	ANU	8 20	80 41
463	Wedakanda	PR	5180.0	5180.0	I/F	2	6	12	2	ANU	-	-
478	Wilpattu Block 1	NP	54953.2	54953.2	P/F	0	0	0	0	ANU PUT	8 33.5	80 1
480	Wilpattu Block 3	NP	22981.4	22981.4	P/F	0	0	0	0	ANU	8 33.5	80 1
481	Wilpattu Block 4	NP	25252.9	25252.9	P/F	0	0	0	0	ANU	8 33.5	80 1
496	Yoda Ela	FR	2288.2	1585.6	I/F	1	2	6	1	ANU	-	-
	Totals		93329.2	91650.1	I=25	35	87	231	38			
BADULLA												
29	Bandarawela	PR	15.4	12.6	E/P	0	0	0	0	BAD	-	-
39	Bibilehela	PR	610.0	606.3	I/F	1	1	6	1	BAD MON	-	-
84	Ella	PR	52.2	52.2	E/P	0	0	0	0	BAD	-	-
89	Erabedda	PR	1538.9	1538.8	E/P	0	0	0	0	BAD	-	-
94	Ettalapitiya	PR	269.1	269.1	E/P	0	0	0	0	BAD	-	-
123	Hakgala	SNR	1141.6	1141.6	I/F	1	2	10	2	BAD NUW	6 55	80 48
127	Haputale	FR	141.3	141.1	E/P	0	0	0	0	BAD	-	-
156	Judges Hill	PR	10.9	10.7	E/F	0	0	0	0	BAD	-	-
183	Karandekumbura	PR	72.8	72.8	E/P	0	0	0	0	BAD	-	-
611	Keeriyagolla	OSF	125.0	125.0	I/F	1	1	6	1	BAD	7 4	81 4
610	Kithedallakanda	OSF	100.0	100.0	I/F	1	1	5	1	BAD	7 0	81 4
206	Kohile	PR	12.1	12.1	E/F	0	0	0	0	BAD	-	-
213	Kotakitulakanda	PR	60.7	60.7	E/C	0	0	0	0	BAD	-	-
609	Madigala	OSF	1350.0	1350.0	I/F	2	3	10	2	BAD	7 19	81 16
239	Maduru Oya Block 1	NP	51469.4	51469.4	I/F	3	8	18	3	BAD AMP POL	7 29	81 125
276	Migollegama	PR	141.2	141 2	I/392	0	0	0	0	BAD	-	-
306	Namunukula	PR	279.3	279.3	I/F	1	2	6	1	BAD	-	-
327	Ohiya	PR	1925.5	1769.1	I/F	2	3	11	2	BAD NUW	-	-
357	Pattipola	FR	394.9	393.3	I/?	0	0	0	0	BAD	-	-
392	Ravana Ella	S	1932.0	1932.0	I/F	2	2	6	1	BAD	-	-
393	Rawanella	PR	331.8	331.8	E/P	0	0	0	0	BAD	-	-
426	Tangamalai	S	131.5	131.5	I/F	2	2	6	1	BAD	-	-

No	Name	Designation	Notified (ha)	Present (ha)	Status'.	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
439	Udalelegama	FR	17.9	17.9	E/C	0	0	0	0	BAD	-	-
608	Welanwita	OSF	8500.0	8500.0	I/F	4	10	33	6	BAD	6 40	81 0
468	Welegama	PR	639.0	639.0	I/F	1	1	5	1	BAD	-	-
	Totals		68203.3	68043.2	I=12	21	36	122	22			
HAMBANTOTA												
35	Bedigantota	PR	8093.7	7527.2	I/237	0	0	0	0	HAM	-	-
44	Bundala	S	6216.0	6216.0	I/S	1	2	6	1	HAM	6 10.5	81 12
115	Gonadeniya	FR	414.4	414.4	E/P	0	0	0	0	HAM	-	-
126	Hambantota	PR	1165.5	1125.0	E/P	0	0	0	0	HAM	-	-
523	Kahanda Kalapuwa	OSF	200.0	200.0	S/M	0	0	0	1	HAM	6 4	80 53
164	Kalametiya Kalapuwa	S	712.0	712.0	S/F	0	0	0	1	HAM	6 5.5	80 575
178	Kanumuldeniya	FR	678.7	678.7	S/F	1	2	8	1	HAM MTR	-	-
179	Kaparella Uswewa	FR	564.4	564.4	E/P	0	0	0	0	HAM	-	-
180	Kaparella Uswewa	PR	214.5	214.5	E/P	0	0	0	0	HAM	-	-
186	Katagamuwa	S	1003.6	1003.6	S/F	1	3	6	1	HAM	-	-
526	Keulakada Wewa	OSF	300.0	300.0	S/F	1	2	6	1	HAM	6 25	81 3
231	Lunugamvehera	NP	2071.8	2071.8	E/N	0	0	0	0	HAM MON	-	-
237	Madunagala	FR	975.2	975.2	S/F	1	1	6	1	HAM	-	-
238	Madunagala	S	0.0	0.0	I/237	0	0	0	0	HAM	-	-
245	Mahakaluweragoda	FR	238.6	238.6	E/P	0	0	0	0	HAM	-	-
249	Mahapitakanda	FR	797.4	722.3	D/F	1	1	5	1	HAM	-	-
275	Middeniya	FR	372.7	372.5	E/P	0	0	0	0	HAM	-	-
525	Miyandagala	OSF	300.0	300.0	S/F	1	2	6	1	HAM	6 18	81 11
322	Nimalawa	S	0.0	0.0	E/N	0	0	0	0	HAM	-	-
337	Pallemalala	S	13.8	13.8	E/N	0	0	0	0	HAM	-	-
388	Rammalakanda	FR	1698.1	1406.7	S/F	3	5	16	2	HAM MTR	-	-
524	Rekawa Kalapuwa	OSF	50.0	50.0	S/M	0	0	0	1	HAM	6 3	80 49
398	Ruhuna Block 1	NP	13679.2	13679.2	S/F	0	0	0	0	HAM	-	-
446	Usangoda	PR	277.2	252.9	E/C	0	0	0	0	HAM	-	-
464	Wedasitikanda	FR	1343.4	1343.4	S/F	2	3	12	2	HAM MON	-	-
485	Wirawila-Tissa	S	4164.2	4164.2	E/N	0	0	0	0	HAM	6 16.5	81 165
491	Yala	SNR	28904.7	28904.7	S/F	0	0	0	0	HAM	6 29	81 28
	Totals		49844.9	49553.5	S=12	10	18	60	12			
KURUNEGALA												
13	Angurukandayaya	PR	139.2	139.2	E/C	0	0	0	0	KUR	-	-
21	Badagamuwa	FR	228.7	213.9	E/P	0	0	0	0	KUR	-	-
22	Badapeliyagoda	FR	49.9	49.9	E/P	0	0	0	0	KUR	-	-
30	Banhedawaka	PR	159.0	159.0	E/P	0	0	0	0	KUR	-	-
32	Barigoda	PR	72.7	72.7	E/P	0	0	0	0	KUR	-	-
33	Barigoda	FR	78.5	78.5	E/P	0	0	0	0	KUR	-	-
630	Bogodayagama	OSF	100.0	100.0	I/F	1	5	1	1	KUR	8 3	80 24
552	Butawella	OSF	1050.0	1050.0	I/F	3	3	12	2	KUR	7 28	80 29
58	Dambuwa	PR	1062.3	1062.3	E/C	0	0	0	0	KUR	-	-
59	Dampitiya	PR	97.1	11.1	E/C	0	0	0	0	KUR	-	-
63	Dawatagolla	FR	43.2	34.7	E/P	0	0	0	0	KUR	-	-
66	Degadaturawa	PR	161.9	161.9	I/F	1	2	5	1	KUR	-	-
67	Dehelgamuwa	FR	58.0	4.1	E/C	0	0	0	0	KUR	-	-
73	Dewalakanda	FR	112.5	112.5	E/P	0	0	0	0	KUR	-	-
74	Digalla	FR	90.3	87.0	E/P	0	0	0	0	KUR	-	-
75	Dikkele Mukalana	FR	336.4	308.1	E/C	0	0	0	0	KUR	-	-
78	Doluwakanda	PR	400.6	400.6	I/F	2	2	6	1	KUR	-	-
80	Dunkanda	PR	301.1	301.1	I/F	1	2	6	1	KUR	-	-
83	Elawaka	PR	168.3	168.3	E/C	0	0	0	0	KUR	-	-
101	Galgiriyakanda	PR	1182.5	1182.5	I/F	2	4	10	2	KUR	-	-
102	Galketiyagama	PR	40.5	40.5	E/C	0	0	0	0	KUR	-	-
109	Getadivula	PR	581.5	581.5	E/P	0	0	0	0	KUR	-	-
116	Gonagama	PR	457.7	235.1	E/C	0	0	0	0	KUR	-	-
118	Gorakadola	FR	191.9	191.1	E/P	0	0	0	0	KUR	-	-
121	Habilikanda	PR	180.9	180.9	E/P	0	0	0	0	KUR	-	-
131	Henegedaralanda	PR	731.7	729.6	I/F	1	1	5	1	KUR	-	-
132	Heraliyawala	PR	13.8	13.8	E/C	0	0	0	0	KUR	-	-
152	Iriminna	FR	25.8	25.8	E/C	0	0	0	0	KUR	-	-
157	Kadawatkele	PR	283.3	267.1	I/F	1	2	6	1	KUR	-	-
158	Kaduruwewa	PR	120.2	120.2	E/P	0	0	0	0	KUR	-	-
163	Kala Oya	PR	4949.7	4949.7	E/C	0	0	0	0	KUR	-	-
165	Kalugala	PR	3365.0	2705.9	I/F	2	2	6	1	KUR	-	-
167	Kalugalkanda	PR	153.0	152.9	E/P	0	0	0	0	KUR	-	-

No	Name	Desig- nation	Notified (ha)	Present (ha)	Status'	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
174	Kankaniyamulla	FR	1108.0	1047.9	E/C	0	0	0	0	KUR	-	-
177	Kanugollayaya	PR	211.7	119.5	I/F	1	1	5	1	KUR	-	-
194	Kendahena	FR	69.2	69.2	E/P	0	0	0	0	KUR	-	-
195	Kendahena	PR	0.2	0.2	I/?	0	0	0	0	KUR	-	-
199	Kimbulwan Oya	S	492.1	492.1	E/N	0	0	0	0	KUR	-	-
202	Kirindigolla	FR	171.0	171.0	E/P	0	0	0	0	KUR	-	-
219	Kumbalpola	PR	102.8	96.3	E/F	0	0	0	0	KUR	-	-
227	Likolawewa	FR	3462.2	3462.2	E/S	0	0	0	0	KUR	-	-
232	Ma Eliya	FR	383.6	381.2	I/?	0	0	0	0	KUR	-	-
256	Manapaya	PR	314.0	314.0	I/F	2	2	6	1	KUR	-	-
261	Maragalkanda	FR	117.1	20.0	E/C	0	0	0	0	KUR	-	-
265	Mawattagama	PR	2152.9	1512.6	E/P	0	0	0	0	KUR	-	-
268	Meeambakanda	FR	124.6	124.6	E/C	0	0	0	0	KUR	-	-
282	Minuwangeta	PR	746.2	139.2	E/C	0	0	0	0	KUR	-	-
283	Mipitikanda	PR	235.9	235.9	E/C	0	0	0	0	KUR	-	-
287	Moragolla	FR	21.3	19.9	E/C	0	0	0	0	KUR	-	-
290	Moturampatana	PR	319.3	235.9	E/C	0	0	0	0	KUR	-	-
291	Mudungoda	PR	774.2	774.2	E/P	0	0	0	0	KUR	-	-
296	Nagolla	FR	123.1	123.1	E/P	0	0	0	0	KUR	-	-
302	Nakele Mukalana	FR	39.8	29.3	E/C	0	0	0	0	KUR	-	-
309	Nawagatta	PR	62.7	54.6	E/C	0	0	0	0	KUR	-	-
311	Nelawa	FR	48.0	48.0	E/C	0	0	0	0	KUR	-	-
312	Nelligalkanda	FR	50.0	50.0	E/C	0	0	0	0	KUR	-	-
317	Nettipolagama	FR	1.0	1.0	I/?	0	0	0	0	KUR	-	-
318	Neugalkanda	PR	376.0	376.0	I/F	1	1	6	1	KUR	-	-
320	Nikawekanda	PR	151.8	151.8	E/C	0	0	0	0	KUR	-	-
323	Nugampola	PR	339.9	339.9	E/C	0	0	0	0	KUR	-	-
336	Pallekele	FR	14513.8	12721.4	I/F	2	4	12	2	KUR	-	-
345	Pannagama	PR	165.9	164.9	E/C	0	0	0	0	KUR	-	-
347	Pannawa-Geppalawa	PR	316.5	314.4	E/C	0	0	0	0	KUR	-	-
349	Pansalhinna	PR	123.4	123.4	E/C	0	0	0	0	KUR	-	-
350	Panwewa	FR	241.7	241.7	E/C	0	0	0	0	KUR	-	-
352	Paragaharuppe	FR	54.0	54.0	E/P	0	0	0	0	KUR	-	-
371	Polgolla	FR	53.6	51.5	E/P	0	0	0	0	KUR	-	-
373	Polkatukanda	FR	151.5	151.5	E/P	0	0	0	0	KUR	-	-
377	Poturwewa	PR	241.6	99.6	E/C	0	0	0	0	KUR	-	-
385	Rambodagalla	PR	202.3	202.3	E/C	0	0	0	0	KUR	-	-
404	Sangappale	PR	4694.8	4505.8	I/F	2	2	5	1	KUR	-	-
405	Sawarangalawa	PR	6309.5	5530.0	E/S	0	0	0	0	KUR PUT	-	-
420	Sundapola	FR	306.9	121.6	E/P	0	0	0	0	KUR	-	-
422	Talagomuwa	FR	81.3	81.3	E/C	0	0	0	0	KUR	-	-
553	Talpattekanda	OSF	150.0	150.0	I/F	1	2	5	1	KUR	7 47	80 22
629	Tambutakanda	OSF	250.0	250.0	I/F	1	2	6	1	KUR	8 5	80 14
433	Timbiriwewa	PR	1274.0	56.8	E/C	0	0	0	0	KUR	-	-
440	Udapolakanda	PR	63.9	63.9	E/S	0	0	0	0	KUR	-	-
462	Waulkele	FR	20.7	20.7	E/C	0	0	0	0	KUR	-	-
473	Welikumbura	FR	80.9	80.9	E/C	0	0	0	0	KUR	-	-
475	Weuda Mukalana	FR	152.1	152.1	E/S	0	0	0	0	KUR	-	-
489	Yakdessakanda	PR	1011.7	1010.9	I/F	3	2	12	2	KUR	-	-
	Totals		29098.1	26346.3	1=17	27	39	114	21			
MATALE												
567	Amsawagama	OSF	450.0	450.0	I/F	1	1	5	1	MTL	7 39	80 40
621	Amsawagama	OSF	450.0	450.0	I/F	1	1	5	1	MTL	7 39	80 40
568	Beliyakanda	OSF	250.0	250.0	I/F	1	1	5	1	MTL	7 49	80 35
622	Beliyakanda	OSF	250.0	250.0	I/F	1	1	5	1	MTL	7 49	80 35
56	Dambulla Oya	PR	104.4	103.2	E/P	0	0	0	0	MTL	-	-
82	Elagomuwa	PR	870.1	870.1	I/F	1	2	5	1	MTL	-	-
569	Etabendiwela	OSF	325.0	325.0	I/F	1	1	5	1	MTL	7 50	80 38
623	Etabendiwela	OSF	325.0	325.0	I/F	1	1	5	1	MTL	7 50	80 38
560	Galboda	OSF	600.0	600.0	I/F	1	1	5	1	MTL	7 38	80 44
614	Galboda	OSF	600.0	600.0	I/F	1	1	5	1	MTL	7 38	80 44
571	Gederagalpatana	OSF	1500.0	1500.0	I/F	2	3	10	2	MTL	7 44	80 42
625	Gederagalpatana	OSF	1500.0	1500.0	I/F	2	3	10	2	MTL	7 44	80 42
566	Gosgahapatana	OSF	750.0	750.0	I/F	1	1	5	1	MTL	7 41	80 40
620	Gosgahapatana	OSF	750.0	750.0	I/F	1	1	5	1	MTL	7 41	80 40
564	Heratgedara	OSF	650.0	650.0	I/F	1	3	10	2	MTL	7 41	80 47
618	Heratgedara	OSF	650.0	650.0	I/F	1	3	10	2	MTL	7 41	80 47
574	Hiriwaduna	OSF	950.0	950.0	I/F	1	3	6	1	MTL	8 2	80 44
628	Hiriwaduna	OSF	950.0	950.0	I/F	1	3	6	1	MTL	8 2	80 44

No	Name	Desig-nation	Notified (ha)	Present (ha)	Status	No tran	Leng tran	No plot	No day	District(s)	Lat.		Long.	
559	Inamalawa	OSF	600.0	600.0	I/F	0	0	0	0	MTL	7	37	80	39
613	Inamalawa	OSF	600.0	600.0	I/144	0	0	0	0	MTL	7	37	80	39
144	Inamaluwa	PR	309.6	309.6	I/F	2	4	12	2	MTL	-		-	
145	Inamaluwa	FR	1896.9	1863.6	E/P	0	0	0	0	MTL	-		-	
565	Makulussa	OSF	325.0	325.0	I/F	1	2	5	1	MTL	7	32	80	36
619	Makulussa	OSF	325.0	325.0	I/F	1	2	5	1	MTL	7	32	80	36
558	Masawa	OSF	150.0	150.0	I/F	1	1	6	1	MTL	7	43	80	32
612	Masawa	OSF	150.0	150.0	I/F	1	1	6	1	MTL	7	43	80	32
266	Medaulpota	PR	2340.2	2340.2	I/460	0	0	0	0	MTL POL	-		-	
572	Menikdeniya	OSF	450.0	450.0	I/F	1	1	5	1	MTL	7	45	80	38
626	Menikdeniya	OSF	450.0	450.0	I/F	1	1	5	1	MTL	7	45	80	38
319	Nikawehera	PR	33.2	33.2	E/C	0	0	0	0	MTL	-		-	
561	Opalagala	OSF	350.0	350.0	I/F	1	1	5	1	MTL	7	35	80	42
615	Opalagala	OSF	350.0	350.0	I/F	1	1	5	1	MTL	7	35	80	42
335	Pallegama-Himbiliyakada	PR	4547.2	4547.2	I/F	2	3	10	2	MTL	-		-	
364	Pelwehera	PR	240.0	240.0	E/C	0	0	0	0	MTL	-		-	
365	Pelwehera	FR	1925.9	1925.9	E/C	0	0	0	0	MTL	-		-	
376	Potawa	PR	77.2	77.2	E/C	0	0	0	0	MTL	-		-	
573	Puswellagolla	OSF	10000.0	10000.0	I/F	4	6	20	4	MTL	7	46	80	46
627	Puswellagolla	OSF	9200.0	9200.0	I/F	4	6	25	5	MTL	7	46	80	46
562	Sacombe	OSF	250.0	250.0	I/F	1	1	5	1	MTL	7	37	80	42
616	Sacombe	OSF	250.0	250.0	I/F	1	1	5	1	MTL	7	37	80	42
563	Talabugahaela	OSF	300.0	300.0	I/F	1	1	5	1	MTL	7	38	80	45
617	Talabugahaela	OSF	300.0	300.0	I/F	1	1	5	1	MTL	7	38	80	45
570	Tottawelgola	OSF	800.0	800.0	I/F	1	1	5	1	MTL	7	50	80	41
624	Tottawelgola	OSF	800.0	800.0	I/F	1	1	5	1	MTL	7	50	80	41
466	Wegodapola	PR	418.5	398.2	E/C	0	0	0	0	MTL	-		-	
	Totals		41726.9	41726.9	I=36	45	65	246	48					
MONARAGALA														
27	Bakinigahawela	FR	200.3	200.3	I/F	1	1	5	1	MON	-		-	
605	Balanagala	OSF	800.0	800.0	I/F	1	3	6	1	MON	7	21	81	22
589	Begahapatana	OSF	325.0	325.0	I/F	1	2	6	1	MON	6	46	81	8
593	Bolhindagala	OSF	375.0	375.0	I/F	2	3	6	1	MON	6	27	81	13
61	Daragoda	FR	748.9	748.9	E/P	0	0	0	0	MON	-		-	
575	Dewagiriya	OSF	600.0	600.0	I/F	2	4	10	2	MON	6	32	81	1
579	Diggala	OSF	250.0	250.0	I/F	1	1	5	1	MON	6	50	81	16
586	Diggalahela	OSF	200.0	200.0	I/F	1	1	6	1	MON	6	57	81	34
580	Dummalahela	OSF	125.0	125.0	I/F	1	1	5	1	MON	6	58	81	19
606	Dyabodahela	OSF	1100.0	1100.0	I/F	1	3	10	2	MON	7	25	81	25
97	Gal Oya Valley	NP	25899.9	25899.9	I/F	2	15	18	3	MON	7	11.5	81	295
98	Gal Oya Valley North-East	S	12432.0	12432.0	I/F	1	3	6	1	AMP MON	7	11.5	81	295
99	Gal Oya Valley South-West	S	15281.0	15281.0	I/F	1	3	6	1	AMP MON	7	11.5	81	295
594	Golupitiyahela	OSF	200.0	200.0	I/F	1	1	6	1	MON	7	11	80	21
584	Guruhela	OSF	275.0	275.0	I/F	1	1	5	1	MON	6	52	81	29
187	Kataragama	S	837.7	837.7	I/S	0	0	0	0	MON	-		-	
585	Kitulhela	OSF	450.0	450.0	I/F	1	1	6	1	MON	7	0	81	28
577	Korathalhinna	OSF	1500.0	1500.0	I/F	2	3	11	2	MON	6	47	81	22
582	Lolehela	OSF	400.0	400.0	I/F	1	1	5	1	MON	6	52	81	25
581	Monerakelle	OSF	1650.0	1650.0	I/F	3	5	15	3	MON	6	54	81	21
591	Murutukanda	OSF	800.0	800.0	I/F	2	3	11	2	MON	6	48	81	11
305	Namandiya	FR	861.4	790.6	I/F	1	2	5	1	MON	-		-	
595	Radaliwinnekota	OSF	900.0	900.0	I/F	1	2	6	1	MON	7	16	81	17
590	Randeniya	OSF	300.0	300.0	I/F	1	2	6	1	MON	6	47	81	6
607	Rediketiya	OSF	3900.0	3900.0	I/F	1	5	10	2	MON	7	22	81	29
399	Ruhuna Block 2	NP	9931.0	9931.0	S/F	0	0	0	0	MON	-		-	
400	Ruhuna Block 3	NP	40775.4	40775.4	S/F	0	0	0	0	MON	-		-	
401	Ruhuna Block 4	NP	26417.7	26417.7	I/F*	1	6	12	2	MON	-		-	
402	Ruhuna Block 5	NP	6656.2	6656.2	I/F	1	15	18	3	MON	-		-	
408	Senanayake Samudra	S	9323.9	9323.9	E/N	0	0	0	0	MON	7	11.5	81	295
592	Sitarama	OSF	800.0	800.0	I/F	3	7	12	2	MON	6	23	81	14
438	Uda Walawe	NP	30821.0	30821.0	S/F	3	9	18	3	MON RAT	6	29.5	80	51
576	Ulgala	OSF	1500.0	1500.0	I/F	1	6	12	2	MON	6	43	81	16
578	Ulgala (old)	OSF	225.0	225.0	I/F	1	2	6	1	MON	6	44	81	19
583	Velihela	OSF	200.0	200.0	I/F	1	1	5	1	MON	6	53	81	27
604	Viyanahela	OSF	900.0	900.0	I/F	1	3	10	2	MON	7	17	81	22
588	Wadinahela	OSF	700.0	700.0	I/F	1	2	6	1	MON	6	42	81	8
587	Westminster Abbey	OSF	800.0	800.0	I/F	2	3	10	2	MON	7	2	81	33

No	Name	Designation	Notified (ha)	Present (ha)	Status*	No tran	Leng tran	No plot	No day	District(s)	Lat.	Long.
	Totals		107023.5	106952.7	I=32	42	111	266	48			
POLONNARUWA												
597	Badanagala	OSF	200.0	200.0	I/F	1	2	6	1	POL	7 45	81 6
95	Flood Plains	NP	17350.7	17350.7	E/N	0	0	0	0	POL	8 0.5	81 7
96	Gal Oya	PR	9036.6	8897.4	I/F	1	3	12	2	POL	-	-
113	Giritale	PR	1077.3	1063.1	E/C	0	0	0	0	POL	-	-
598	Gunner's Quoin	OSF	450.0	450.0	I/F	1	2	6	1	POL	7 52	81 8
596	Kudagala North	OSF	475.0	475.0	I/F	2	2	6	1	POL	7 41	81 6
601	Kumadiya Tulana	OSF	400.0	400.0	I/F	1	3	6	1	POL	8 7	81 9
599	Mahamorakanda	OSF	175.0	175.0	I/F	1	2	6	1	POL	8 11	80 53
502	Medirigiriya Tulana	OSF	8000.0	8000.0	I/F*	2	9	18	3	POL	8 12	80 59
279	Minneriya	PR	2444.3	828.0	I/F	1	2	6	1	POL	-	-
280	Minneriya-Giritale	S	6693.5	6693.5	I/627	0	0	0	0	POL	8 1.5	80 53
281	Minneriya-Giritale Block 1	NR	7529.1	7529.1	I/F	2	8	14	2	POL	-	-
602	Mutugalla Tulana	OSF	425.0	425.0	I/F	1	3	6	1	POL	7 59	81 12
600	Palliyagodella Tulana	OSF	9600.0	9600.0	I/F	1	9	18	3	POL	8 12	81 9
374	Polonnaruwa	S	1521.6	1521.6	E/N	0	0	0	0	POL	7 56	81 0
396	Riverine	S	824.1	824.1	E/N	0	0	0	0	AMP POL	7 43.5	80 595
410	Sigiriya	S	5099.0	5099.0	I/F	2	6	12	2	POL MTL	-	-
603	Sinnakallu	OSF	450.0	450.0	I/F	1	3	6	1	POL	8 4	81 12
417	Somawathiya Block 1	NP	21056.5	21056.5	P/F	0	0	0	0	POL TRI	8 11.5	81 6
418	Somawathiya Block 2	NP	16589.2	16589.2	P/F	0	0	0	0	POL TRI	8 11.5	81 6
436	Trikonamadu	NR	25019.2	25019.2	P/F	0	0	0	0	POL BAT	8 12	81 175
460	Wasgomuwa Lot 1	NP	29036.0	29036.0	I/F	3	26	36	6	POL MTL	7 45.5	80 58
461	Wasgomuwa Lot 2	NP	4612.7	4612.7	I/460	0	0	0	0	POL	7 45.5	80 58
	Totals		73320.0	71564.5	I=14	20	80	158	26			
PUTTALAM												
10	Ambanmukalana	FR	1085.9	1004.8	I/F	1	3	6	1	PUT	-	-
15	Arachchikoturwa	PR	0.8	0.8	E/C	0	0	0	0	PUT	-	-
554	Arukalu	OSF	2100.0	2100.0	I/F	2	4	13	2	PUT	8 17	79 50
16	Attavillu	PR	429.4	429.4	E/C	0	0	0	0	PUT	-	-
17	Attavillu	FR	9009.1	5179.4	I/F	1	2	5	1	PUT	-	-
31	Bar Reef Marine	S	30670.0	30670.0	E/N	0	0	0	0	PUT	-	-
556	Chilaw Lake	OSF	300.0	300.0	I/M	0	0	0	1	PUT	7 32	79 48
93	Etaritiya	PR	1558.0	1428.5	E/P	0	0	0	0	PUT	-	-
103	Galkuliya	PR	4775.3	4127.8	E/P	0	0	0	0	PUT	-	-
148	Ipolagama	PR	4451.5	4203.7	E/C	0	0	0	0	PUT	-	-
555	Kalu Aru	OSF	600.0	600.0	I/M	0	0	0	2	PUT	8 17	79 51
259	Manuwangama-Nariyagama	FR	537.6	244.2	E/C	0	0	0	0	PUT	-	-
301	Nakele	PR	80.9	80.9	E/C	0	0	0	0	PUT	-	-
375	Pomparippu	FR	7021.3	7021.3	I/?	0	0	0	0	PUT	-	-
557	Puttalam Lagoon	OSF	400.0	400.0	I/M	0	0	0	1	PUT	8 8	79 50
381	Pyrendawa	PR	125.5	110.6	E/P	0	0	0	0	PUT	-	-
382	Pyrendawa	FR	361.3	360.4	E/P	0	0	0	0	PUT	-	-
406	Sellankandal	FR	4268.6	4265.8	I/F	2	3	6	1	PUT	-	-
407	Sellankandal	PR	5526.0	4542.2	I/F	2	4	10	2	PUT	-	-
434	Tonigala	PR	1486.8	937.3	E/P	0	0	0	0	PUT	-	-
444	Unaliya	PR	1400.2	1096.7	E/C	0	0	0	0	PUT	-	-
458	Wanniyagama	PR	15596.6	14417.8	I/F	1	5	10	2	PUT	-	-
465	Weerakulicholai-Elavankulam	PR	30128.9	29192.4	I/F	3	9	18	3	PUT	-	-
467	Weherabendikele	PR	285.7	275.0	E/C	0	0	0	0	PUT	-	-
479	Wilpattu Block 2	NP	7021.4	7021.4	P/F	0	0	0	0	PUT	8 33.5	80 1
482	Wilpattu Block 5	NP	21484.8	21484.8	P/F	0	0	0	0	PUT	8 33.5	80 1
484	Wilpotha	PR	2665.3	2547.5	E/P	0	0	0	0	PUT	-	-
	Totals		69015.9	62002.8	I=10	12	30	68	16			

*KEY:

E/C: Exclude from NCR (forest converted)
E/F: Exclude from NCR (forest < 100 ha threshold)
E/N: Exclude from NCR (non forest)
E/P: Exclude from NCR (plantation forest)
E/S: Exclude from NCR (scrub)

D/F: Visited but too degraded to sample (forest)
D/M: Visited but too degraded to sample (mangrove)

I/F: Include in NCR (forest)
I/F*: Included in NCR, surveys ongoing (forest)
I/M: Include in NCR (mangrove)
I/?: Include ? (listed in FD Register but not mapped)
I/364: Include as part of No. 364

S/F: Sampled (forest)
S/M: Sampled (mangrove)

P/F: Politically inaccessible (forest)