Annotated Bibliography of South African Indigenous Evergreen Forest Ecology

C J GELDENHUYS

A Report of the Committee for Terrestrial Ecosystems
National Programme for Environmental Sciences

SOUTH AFRICAN NATIONAL SCIENTIFIC PROGRAMMES REPORT NO

107

Issued by
Foundation for Research Development
Council for Scientific and Industrial Research
P O Box 395
PRETORIA
0001

from whom copies of reports in this series are available on request.

Printed in 1985 in the Republic of South Africa by the
Graphic Arts Division of the CSIR

ISBN 0 7988 3403 X

Compiler's address -

C J Geldenhuys
Saasveld Forestry Research Centre
South African Forestry Research Institute
Private Bag X6515
GEORGE
6530

PREFACE

Research in the indigenous evergreen forest biome of South Africa has been limited in the past to a number of scattered studies. In order to coordinate current activities, to stimulate new research and to synthesize available scientific information, the Task Group for Forest Biome Research was convened in 1980.

The Task group reports to the Terrestrial Ecosystems Committee of the National Programme for Environmental Sciences administered by the CSIR. The National Programme is a cooperative undertaking of scientists and scientific institutions in South Africa concerned with research related to environmental problems. It includes research designed to meet local needs as well as projects being undertaken in South Africa as contributions to the international programme of SCOPE, the body set up in 1969 by ICSU (International Council of Scientific Unions) to act as a focus of international non-governmental scientific effort in the environmental field.

Terms of reference for the Task Group were:

- to coordinate and actively support efforts to classify, map and characterise the indigenous forests of South Africa,
- to encourage studies on the biogeography and phytosociology of indigenous forests, and
- to stimulate research into the functional processes of selected forest ecosystems, both within mature forests and on the forest margin.

The first phase of activities of the Task Group has been the compilation of a bibliography of forest ecology, production of a forest map, compilation of a list of forest research projects, and the holding of a workshop on the structural classification of forests. This document attempts to bring together a comprehensive list of forest references, pertaining to work carried out or initiated prior to the start of the Forest Biome Project.

ACKNOWLEDGEMENTS

Sincere thanks are expressed to all who assisted in the compilation of this bibliography by contributing references, in particular:

Mr C Boucher (Botanical Research Institute, Stellenbosch)
Mr G J Breytenbach (Saasveld Forestry Research Centre, George)
Mr M J Cameron (Saasveld College for Foresters, George)
Mr A B Cunningham (Department of Agriculture and Forestry, Kwazulu)
Prof D G M Donald (Faculty for Forestry, Stellenbosch)
Dr D Edwards (Botanical Research Institute, Pretoria)
Prof J Hanks (Institute of Natural Resources, Pietermaritzburg)

Mr B J Huntley (FRD, CSIR, Pretoria)
Mrs M L Jarman (FRD, CSIR, University of Cape Town, Rondebosch)
Mr N Jarman (Seaweed Research Laboratory, Rondebosch)
Mr O Kerfoot (Department of Botany, University of Witwatersrand)
Mr J H Koen (Saasveld Forestry Research Centre, George)
Dr R F Lawrence (7 Wesley Hill, Port Alfred)
Dr R A Lubke (Department of Plant Sciences, Rhodes University, Grahamstown)
Mr I A W Macdonald (Natal Parks Board, currently FRD, CSIR, University of Cape Town)
Mr S Russell (Department of Botany, University of Fort Hare, Alice)
Dr J C Scheepers (Botanical Research Institute, Pretoria)
The late Dr D M Skead (Nature Conservation Division, Barberspan)
Mr H C Taylor (Botanical Research Institute, Stellenbosch)
Mr R H Taylor (Natal Parks Board, St Lucia)
Prof G Theron (Department of Botany, University of Pretoria)
Mr J M Theron (Faculty for Forestry, Stellenbosch)
Dr K Tinley (P O Box 2021, Beacon Bay, currently Australia)
Prof H J T Venter (Deparment of Botany, University of the Orange Free State, Bloemfontein)
Dr P J Weisser (Botanical Research Institute, Pretoria)

The assistance of Mrs Sue Dean in editing the document and abstracting key words, etc. and Mrs Marie Cronje in typing the document is greatly appreciated.

ABSTRACT

Annotated references to 519 publications are presented, together with keyword listings and keyword, regional, place name and taxonomic indices. This bibliography forms part of the first phase of the activities of the Forest Biome Task Group.

SAMEVATTING

Die bibliografie bevat ge-annoteerde verwysings na 519 publikasies, tesame met sleutelwoordlyste en indekse volgens sleutelwoorde, streke, plekname en taksonomie. Dit vorm deel van die eerste fase van die aktiwiteite van die Woudbioomprojek.

TABLE OF CONTENTS

ANNOTATED BIBLIOGRAPHY OF SOUTH AFRICAN INDIGENOUS EVERGREEN FOREST ECOLOGY

INTRODUCTION

This document attempts to bring together a comprehensive list of forest references, pertaining to work carried out or initiated prior to the start of the Forest Biome Project. It lists references to research, review and discussion papers dealing with aspects of forest ecology in its broadest sense, up to the end of 1984.

The Forest Biome extends as a relatively narrow strip and isolated patches from 22° to 34°S and from 18° to 32°E, on the coastal side of the mountain ranges of South Africa.

Reports published in the open literature, theses and formal departmental bulletins are recorded. Brief reports in periodicals, newspapers and pamphlets have usually been omitted, as have university honours and undergraduate project reports. Keywords and in some cases abstracts or brief summaries of reports have been provided. A considerable volume of unpublished information remains in unpublished reports in universities and inaccessible departmental files.

References are listed alphabetically by author name. Keywords have been provided for all references. Indices list references according to keywords, regions, place names and taxonomy.

BIBLIOGRAPHY

1
Acocks, J.P.H. (1953) 1975 Veld types of South Africa. **Memoirs of the Botanical Survey of South Africa (28); 40**, 192 pp
This account provides a preliminary description of the vegetation map of South Africa. It provides an outline of the botanical and related agro-ecological problems and theories relating to the origins, interrelationships and uses of the veld types. Seventy veld types and seventy-five variations are recognized and described. These include Coastal Tropical Forest types, and thornveld with five variations, Alexandria forest (2), Pondoland Coastal Plateau sourveld (3), Knysna forest (4), 'Ngongoni Veld (5), Zululand thornveld (6) with two variations, and Eastern Province thornveld (7) with two variations; Inland Tropical Forest types, i.e. North-eastern Mountain sourveld (8) and Lowveld sour bushveld (9); Karoo and Karroid including Valley bushveld (23) with six variations and some affinity with the forests; and Temperate and transitional forest and scrub types including Highland sourveld (44a), Dohne sourveld (44b) and Natal mist belt 'Ngongoni veld (45).
MAP, SPECIES LIST, VEGETATION CHANGE, VEGETATION TYPE

2
Adamson, R.S. 1925 The native vegetation of Kirstenbosch. **Journal of the Botanical Society of South Africa 11**:19-23
It includes Silver Tree Woods and Bush communities.
COMMUNITY, FYNBOS, SPECIES LIST

3
Adamson, R.S. 1927 Some problems of vegetation in South Africa. **South African Journal of Science 24**:37-49
CLIMATE, SUCCESSION, VEGETATION CHANGE

4
Adamson, R.S. 1927 The plant communities of Table Mountain. I. Preliminary account. **Journal of Ecology 15**:278-309
The three main types of vegetation, including forest, are briefly considered in regard to their interrelations and relationship with the vegetation of other regions.
COMMUNITY, FYNBOS, SPECIES LIST

5
Adamson, R.S. 1929 The vegetation of the south-western Region: **The botanical features of the south-western Cape Province.** Speciality Press, Cape Town and Wynberg. 127 pp.
FYNBOS, VEGETATION TYPE

6
Adamson, R.S. 1931 The plant communities of Table Mountain. II. Life-form dominance and succession. **Journal of Ecology 19**:304-320
COMMUNITY, SUCCESSION, VEGETATION STRUCTURE

7
Adamson, R.S. 1934 Fossil plants from Fort Grey near East London. **Annals of the South African Museum 31**:67-96
The paper is a report on the finding of macroscopic remains including Podocarpus and possibly Widdringtonia, fruits referred to Curtisia, as well as the remains of other dicots and monocots along the southern coast at Fort Grey near East London.
PALAEOECOLOGY, VEGETATION CHANGE

8
Adamson, R.S. 1938 **Vegetation of South Africa.** British Empire Vegetation Committee, London. 235 pp.
The monograph discusses five vegetation types - bush (sclerophyll), forest, savanna, grass and semi-desert - with reference to physiography, geology, meteorology and ecology. Vegetation is finally regrouped into larger biological-climatological-geographical types and the effects of climatic changes are discussed. In the chapter on forest vegetation the structural and ecological differentiation in composition between forests of temperate, warm temperate, sub-tropical and montane regions are discussed. Each of the forest types is discussed in relation to occurrence, composition, environment, modification, succession and its value to man.
CLIMATE, SPECIES LIST, SUCCESSION, UTILISATION, VEGETATION CHANGE, VEGETATION TYPE

9
Adamson, R.S. 1947 Some geographical aspects of the Cape Flora. **Transactions of the Royal Society of South Africa 31**(5):437-464
The forest flora, its affinities and degree of endemism are discussed. Extension of Bews' argument that the Natal forests are tropical in origin to "the forests within the area of the Cape Flora" is not regarded justifiable.
FLORA, ORIGIN, PHYTOGEOGRAPHY

10
Adamson, R.S. & Salter T.M. (eds.) 1950 **Flora of the Cape Peninsula.** Juta, Cape Town.
FLORA, IDENTIFICATION AID, SPECIES LIST

11
Adamson, R.S. & Currin, M.M. 1951 Buried trees on the Cape Flats. **Transactions of the Royal Society of South Africa 35**:443-462
CLIMATE, PALAEOECOLOGY, PHYTOGEOGRAPHY, VEGETATION CHANGE

12
Aitken, R.D. 1921 The plant succession in a type of Midland tree veld in Natal. **South African Journal of Science 18**:233-243
SUCCESSION

13
Aitken, R.D. 1922 The effect of slope exposure on the climate and vegetation of a hill near Maritzburg. **South African Journal of Science 19**:207-217
CLIMATE, COMMUNITY, ENVIRONMENT

14
Aitken, R.D. & Gale, G.M. 1921 Botanical survey of Natal and Zululand. A reconnaissance trip through north-eastern Zululand. **Memoirs of the Botanical Survey of South Africa 2**:1-19
A short account of various vegetation types, including forest, in the Ingwavuma District is presented. The physical features of the area are described. A list of plants collected is included.
ENVIRONMENT, PHYTOGEOGRAPHY, SPECIES LIST, VEGETATION TYPE

15
Amm, M. 1978 The Blouberg. **Trees in South Africa 30**:58-62
A short description is given of the environment and vegetation. Concern is expressed over the destruction of magnificant forest. A list of trees is provided.
CONSERVATION, ENVIRONMENT, SPECIES LIST, VEGETATION TYPE

16
Andrag, R.H. 1977 (Studies in the Cedarberg on (i) the status of the Clanwilliam cedar (Widdringtonia cedarbergensis Marsh) (ii) outdoor recreation). **Studies in die Sederberge oor (i) die status van die Clanwilliam seder (Widdringtonia cedarbergensis Marsh) (ii) buitelugontspanning.** Unpublished MSc thesis, University of Stellenbosch, Stellenbosch.
A short description is given of the dry and wet kloof forests and bush.
AUTECOLOGY, CONSERVATION, DISTRIBUTION, RECREATION

17
Anonymous 1880 **Commission appointed to enquire into and report on the extent and condition of forest lands in the colony.** W. Watson, Pietermaritsburg.
A synthesis of accounts of forest destruction as reported by local inhabitants. Some recommendations are given on exotic tree planting.
CONSERVATION, DISTRIBUTION, DISTURBANCE, EXOTIC, UTILISATION

18
Anonymous 1935 **Forests in relation to climate, water conservation and erosion.** Bulletin 159, Department of Agriculture and Forestry, Government Printer, Pretoria.
CLIMATE, CONSERVATION, EROSION, HYDROLOGY

19
Anonymous 1966 Natal forests 1876-1966. What has been achieved ? **Natal Wildlife 7**:6-9
CONSERVATION

20
Anonymous 1970 **Checklist of Insects on forest trees and shrubs in South Africa.** Entomology Memoir 21, Plant Protection Research Institute, Pretoria.
INVERTEBRATE, SPECIES LIST

21
Anonymous 1975 Mapelane ... the highest forested dunes in the world. **African Wildlife 29**:12-13
DUNE, ENVIRONMENT

22
Anonymous 1982 **Forestry Guide Plan for South Africa.** Department of Environment Affairs, Pretoria. 198 pp.
This plan is mainly concerned with analysis of the present forestry sector and projected development of the forest industry. The history of exploitation of indigenous forests is discussed. The present area of indigenous forest is estimated at 300 000 ha of which 84 000 ha is in private ownership. Since 1876 approximately 3 000 000 m^3 of timber were extracted from the forests of which 100 000 m^3 per year were cut during 1909-1918. During the 40 years of 1940-1980 only about 5 500 m^3 per year were cut. It is highly unlikely that this figure will increase during the next 50 years. Reasons for this limited off-take are: uncontrolled exploitation in the past did not provide for regeneration; natural species composition was changed by selective exploitation and increment is a maximum of 3 m^3/ha/yr. Aesthetic values are now considered to be of greater value for the future.
CONSERVATION, FORESTRY, HISTORY, MANAGEMENT, TIMBER, UTILISATION

23
Arnell, S. 1963 **Hepaticeae of South Africa.** National Sciences Research Council, Stockholm. 411 pp.
HABITAT, LIVERWORT, TAXONOMY

24
Astley Maberley, C.T. 1950 The African bush-pig - sagacious and intelligent. **African Wildlife 4**(1):14-18
MAMMAL

25
Baijnath, H. & Ramcharun, S. 1983 Aspects of pollination and floral development in Ficus capensis Thunb. (Moraceae). **Bothalia 14**:883-888
A unique obligatory symbiosis between Ficus capensis Thunb., and its pollinator, Ceratosolen capensis Grandi is described. Flowers from both aerial and geocarpic syconia may be pollinated and produce seeds. All female flowers have the potential to produce either seeds or galls and variation is merely one of gross morphology. Flowering is distinctly asynchronous. Seeds are dispersed by various fruit predators and germinate very easily under warm humid conditions.

DISPERSAL, EVOLUTION, FRUIT, INVERTEBRATE, MORPHOLOGY, POLLINATION, REPRODUCTIVE BIOLOGY

26
Ballenden, S. St. C. 1938 Umdoni or Waterwood (Syzigium cordata). **Journal of the South African Forestry Association 1**:60-61
This tree is found along the coast belt of Natal and Zululand and inland along river valleys up to altitudes of 900 m. The finest specimens and largest areas of pure Um'Doni or Swamp forest occur in swamp areas along the Zululand coast. These forests are very tropical in appearance with their palms, wild bananas and creeping ferns. The canopy consists of dark green foliage composed of tree crowns intertwined with masses of creepers, e.g. Entada scandens, with great bean-like pods over 2 m long and 150 mm wide. Under these conditions Um'Doni thrives almost to the entire exclusion of other tree species. Occasional specimens of Syzygium guineensis, Macaranga capensis, Rauvolfia natalensis, Voacanga dregei, Schefflera umbellifera are found, and in places Barringtonia racemosa forms an understorey over large areas.
AUTECOLOGY, COMMUNITY, DISTRIBUTION, ENVIRONMENT, HABITAT, SWAMP

27
Barrow, J. 1801 **An account of travels into the interior of southern Africa.** Volume 1:339-340
A list is given of 44 trees which provide useful timber.
HISTORY, TIMBER

28
Bayer, A.W. 1936 **An account of the plant communities of the coastal belt and midlands of Zululand.** DSc thesis, University of South Africa, Pretoria.
COMMUNITY, SPECIES LIST

29
Bayer, A.W. 1938 An account of the plant ecology of the coastbelt and midlands of Zululand. **Annals of the Natal Museum 8**:371-454
COMMUNITY, ENVIRONMENT, SPECIES LIST, VEGETATION TYPE

30
Bayer, A.W. 1953 Notes on the vegetation of Natal. 2. Mangrove forest. **Bulletin of the Natal Society of the Preservation of Wild Life and Natural Resources 2**:8-11
COMMUNITY, SWAMP, VEGETATION TYPE

31
Bayer, A.W. 1954 Notes on the vegetation of Natal Swamp forest. **Bulletin of the Natal Society for the Preservation of Wild Life and Natural Resources 2**:22-24
SWAMP, VEGETATION TYPE

32
Bell-Reid, W. 1907 Notes on rainfall in forest regions. **Report**

of the South African Association for the Advancement of Science 5:32-33
CLIMATE, HYDROLOGY

33
Bews, J.W. 1912 The vegetation of Natal. **Annals of the Natal Museum** 2:253-332
A general account is given of the plant formation and associations, including coastal bush, Yellowwood bush and inland bush.
VEGETATION TYPE

34
Bews, J.W. 1913 The vegetation of Natal. **Journal of Ecology** 1:75-76
VEGETATION TYPE

35
Bews, J.W. 1913 An ecological survey of the midlands of Natal, with special reference to the Pietermaritzburg District. **Annals of the Natal Museum** 2:485-545
VEGETATION TYPE

36
Bews, J.W. 1914 An ecological survey of the midlands of Natal with special reference to the Pietermaritzburg District. **Journal of Ecology** 2:206-207
VEGETATION TYPE

37
Bews, J.W. 1916 An account of the chief types of vegetation in South Africa, with notes on the plant succession. **Journal of Ecology** 4:129-159 & **South African Journal of Science** 13:599
COMMUNITY, SUCCESSION, VEGETATION STRUCTURE, VEGETATION TYPE

38
Bews, J.W. 1917 South African phytogeography. **South African Geographical Journal** 1:11-22
PHYTOGEOGRAPHY, VEGETATION TYPE

39
Bews, J.W. 1917 The plant ecology of the Drakensberg Range. **Annals of the Natal Museum** 3:511-565
COMMUNITY, MONTANE, SPECIES LIST, VEGETATION TYPE

40
Bews, J.W. 1920 Plant succession and plant distribution in South Africa. **Annals of Botany** 34:287-297
PHYTOGEOGRAPHY, SUCCESSION

41
Bews, J.W. 1920 The plant ecology of the coast belt of Natal.

Annals of the Natal Museum 4:367-467
COMMUNITY, SPECIES LIST, VEGETATION TYPE

42
Bews, J.W. 1921 Some aspects of botany in South Africa and plant ecology in Natal. **South African Journal of Science 18**:63-80
FLORA

43
Bews, J.W. 1921 Some general principles of plant distribution as illustrated by the South African flora. **Annals of Botany 35**:1-36
FLORA, PHYTOGEOGRAPHY

44
Bews, J.W. 1921 **An introduction to the flora of Natal and Zululand.** City Printing Works, Pietermaritzburg. 246 pp.
A key is provided to the families. Genera and species are listed with notes on distribution.
DISTRIBUTION, FLORA, IDENTIFICATION AID, SPECIES LIST

45
Bews, J.W. 1922 The south-east African flora: its origin, migrations and evolutionary tendencies. **Annals of Botany 36**:209-223
EVOLUTION, ORIGIN, PHYTOGEOGRAPHY

46
Bews, J.W. 1925 **Plant forms and their evolution in South Africa.** Longmans, Green & Co., London. 199 pp.
South Africa has many unique advantages in the study of plant distribution and the general evolutionary history of plants. The region has a varied geomorphology, topography and climate. The flora contains two distinct elements: The tropical-subtropical element is by far the larger and occupies all the regions of summer rainfall, except to a certain extent where it mixes with temperate elements at the higher altitudes on the eastern mountain ranges. It forms many diverse types of plant communities such as mangrove forest, hygrophilous forest, mesophytic eastern high forest, mesophytic scrub, tree-veld of various kinds, succulent and thorny scrub, grassveld of various types, karoo and desert. The temperate or mountain and south-western flora occupies chiefly the region of winter rainfall, but extends along the central and eastern mountain ranges of South Africa. Certain types of plant habitat which have existed in Cretaceous times and have remained relatively constant and uniform ever since such as moist tropical forest, stream-banks and swamps, seashores and possibly mountain habitats. It appears reasonable to suppose that primitive types of growth form are most likely to occur at present day in such habitats. The woody form, amongst Angiosperms, is on the whole more ancient then the herbaceous form. Within the tree-shrub group, reduction in size, increase of branching, reduction in size of

leaves, increased branching of leaf veins, increase of fibre in the leaves, production of compound leaves, thorn development, development of succulence, deciduous leaves, and general increase of xerophytism are some of the more evolutionary tendencies. An origin for the tropical-subtropical elements of the South African flora is to be sought for in the vast reservoir of plant life in the tropics to the north. The general migration has been southwards. Purely tropical genera and species have extended farthest south along the eastern coast-belt. The tropical- subtropical trees and shrubs of South Africa fall naturally into three ecological classes which illustrate the principles of ecological evolution. The first class includes the Mangroves and various hygrophilous forest trees with large and nearly always simple leaves. The second larger and more heterogenous class includes mesophytic tall trees of the most primitive form, the light demanding forest-margin smaller trees and shrubs of evolutionary advanced form, a higher proportion of compound leaves, a somewhat irregular deciduous tendency, the beginning of thorn development, free development of coppice shoots, increased branching. The third class consists of tree-veld and xerophytic scrub types. A detailed analysis of 800 species of trees and shrubs has been made and the percentage belonging to various types of growth form determined. In considering various subordinate types of growth form associated with the trees and shrubs a close connection is found between forest margin and marsh types, and many of the subordinate forms may be very ancient. These include lianes, epiphytes, forest parasites and herbaceous undergrowth.
EVOLUTION, MORPHOLOGY, ORIGIN, PHYTOGEOGRAPHY

47
Bews, J.W. 1926 The study of forest vegetation in South Africa. In: Tansley, A.G. & Chipp, T.F. (eds.) **Aims and methods in the study of Vegetation.** British Empire Vegetation Committee, London. p.314-317
METHODOLOGY, PHYTOSOCIOLOGY, VEGETATION STRUCTURE

48
Bews, J.W. 1927 Studies in the ecological evolution of the Angiosperms. **New Phytologist 26**:1-21
EVOLUTION

49
Bews, J.W. & Aitken, R.D. 1923 Researches on the vegetation of Natal. **South African Journal of Science 20**:285-289
See next four summaries.
FLORA, WATER RELATIONS

50
Bews, J.W. & Aitken, R.D. 1923 The measurement of the size of the aeration system of the leaves of certain Natal plants by an injection method. In: Researches on the Vegetation of Natal, Series I. **Memoirs of the Botanical Survey of South**

Natal, Series I. **Memoirs of the Botanical Survey of South Africa** 5:5-23

A method of estimating intercellular space of leaves by injection under reduced pressure with 4% alcohol is described. Investigations were conducted on three species, each representing a definite ecological type, i.e. Podocarpus henkelii of mesic sites, Portulacaria afra as a typical pioneer of river valley scrub and Ptaeroxylon obliquum of variable ecological status. Notes are given on the applicability of the method to over 40 Natal plants and a table of reliable results is given for 28 species, including several forest species. Results indicate that a high degree of development of intercellular space is not simply a response to mesophytic environment, but is probably also related to other factors, e.g. lack of sufficient soil aeration. Shade-leaves have no greater intercellular space than sun-leaves. Species which are successful in varied and unstable habitats, e.g. pioneer species, have a greater degree of variability in their physiological structure and functions than have those which appear later.
SUCCESSION, WATER RELATIONS

51
Bews, J.W. & Aitken, R.D. 1923 The measurement of light intensity in South Africa, with special reference to plant habitats. In: Researches on the vegetation of Natal, Series I. **Memoirs of the Botanical Survey of South Africa** 5:33-44

A method of measuring light intensities by means of liberating iodine from the potassium iodide in the presence of sulphuric acid and titration with sodium thiosulphate has been applied to South African conditions. The effects of altitude, slope and exposure, are illustrated. The method has also been applied to the analysis of certain plant communities, including forests, and to plant succession in Natal.
ENVIRONMENT, HABITAT, LIGHT, SUCCESSION

52
Bews, J.W. & Aitken, R.D. 1923 Some experiments on the rate of water-loss during the drying of leaves. In: Researches on the vegetation of Natal, Series I. **Memoirs of the Botanical Survey of South Africa** 5:44-56

Experiments were conducted on the rate of drying of detached leaves of various species, including Podocarpus falcatus, P. henkelii, Portulacaria afra, Ptaeroxylon obliquum, Trichilia emetica, Cordia caffra and Trema orientalis. The results indicated that succulents have a greater power of resisting water-loss and consequently are able to maintain a large water-balance for a much longer period than non-succulents. Leaves of Podocarpus spp. are more resistant to water loss than dicotyledonous leaves, even though the latter are from plants growing in much drier and more exposed situations than the former. Leaves of dicotyledonous plants vary considerably in the abundance and arrangement of their woody tissues. In some, the lamina of the leaf is divided into a few large "islands" of soft tissue by the lateral veins,

while in others it is divided into numerous minute "islands". The possibility of this exerting a considerable influence on the rate of water-loss is discussed. Leaves with large "islands" of soft tissue showed the highest rates of loss. Leaves with numerous small "islands" usually showed low rates of loss, but this was not invariably the case.
WATER RELATIONS

53
Bews, J.W. & Aitken, R.D. 1923 The distribution and ecology of the genus Cussonia (Thunb.), with some remark upon its probable evolutionary history. In: Researches on the vegetation of Natal. Series I. **Memoirs of the Botanical Survey of South Arica 5**:56-70
A general description of the genus Cussonia and dichotomous key to the species is given. A detailed account of the distribution and ecology of the various species is given and it is shown that C. spicata is the most widely distributed and that it occurs in two very diverse ecological habitats. A study is made of leaf-form in the various species, which are arranged in order of increasing leaf division, C. spicata and C. kraussii having the most highly compound leaves. The juvenile leaves of C. spicata, C. paniculata and C. thyrsiflora are simple and show a gradual transition to the compound adult leves. It is concluded that leaf division may be used as a criterion of evolution within the genus, and a comparison is made of the distribution of the single-leaved and compound-leaved species. This is considered to be suggestive of a tropical origin of the genus. Both in characters of leaf and inflorescence, C. spicata is regarded as the most advanced species. It is also the most variable.
DISTRIBUTION, EVOLUTION, IDENTIFICATION AID, MORPHOLOGY, PHYTO-GEOGRAPHY, TAXONOMY

54
Bews, J.W. & Aitken, R.D. 1925 The water relations of some Natal plants, with special reference to the leaves of "Ptaeroxylon utile" and "Portulacaria afra". In: Researches on the vegetation of Natal, Series II. **Memoirs of the Botanical Survey of South Africa 8**:5-34
A brief account is given of the principal plant communities of the Natal Midlands. It is concluded that the physical differences are likely to have a considerable effect upon the water relations of the plants composing them. A method is described of determining the "water-retaining power" of the leaves of plants. An account is given of the application of this method to a number of plants. From the results it is possible to arrange the leaves in the order of their ability to retain water. It is, however, not considered sufficient evidence of the relative xerophytism of the plant as a whole. Two forest species, Podocarpus henkelii and Xymalos monospora are found to have leaves which are very resistant to water loss. These trees also possess wood of very low water-conducting power, and it is considered that this probably accounts

for the xerophytic character of the leaves. Leaves which loose water rapidly during drying appear to be associated with wood of high water conducting power. Ptaeroxylon obliquum is somewhat peculiar in that the leaves frequently show a high rate of water loss although its wood transmits water very slowly. Its leaves vary considerably in their rate of water loss. Age of the leaf has a considerable effect upon the rate of loss, but this is not considered to afford a complete explanation of the observed variation. Stomatal closure appears to be very slowly in these leaves in response to a diminishing water-content. A study is made of the changes in the water-content of leaves of Ptaeroxylon and Portulacaria. The diurnal changes in water-content of leaves of Ptaeroxylon is found to be very small. Seasonal change is more marked.
COMMUNITY, MORPHOLOGY, VEGETATION TYPE, WATER RELATIONS

55
Bews, J.W. & Aitken, R.D. 1925 The water-retaining capacity of certain woods in relation to their microscopic structure. In: Researches on the vegetation of Natal, Series II. **Memoirs of the Botanical Survey of South Africa 8**:34-41
Timber of 12 indigenous and 19 exotic trees were examined to correlate the rate of drying out of freshly cut specimens and the microscopical structure of the timber. Preliminary results indicate that timber with high water-content dry out more quickly than timber with low initial water-content. Hard and heavy dense woods take longer to dry out than soft or lighter woods. Within a species, trees vary according to age and growing situation. The eucalypts have shorter, narrower xylem elements than the indigenous species, but the more xerophytic indigenous species, e.g. Ptaeroxylon obliquum, are more like eucalypts. The results indicate potential of obtaining a better insight into the meaning of xerophytism.
EXOTIC, HABITAT, MORPHOLOGY, TIMBER, WATER RELATIONS

56
Bews, J.W. & Bayer, A.W. 1931 Researches on the vegetation of Natal. Series III. **South African Journal of Science 28**:158-179
In the third section (p.173-179) the relationship of water conducting efficiency to vessel structure in some Natal trees was investigated. Specific conductivity is low for trees occurring in moist habitats and higher for those occurring in drier habitats. Trees containing vessels with a relatively wide pore have a high conducting efficiency and are able to resist dry conditions and are phylogenetically advanced.
DISTURBANCE, DROUGHT, HABITAT, MORPHOLOGY, WATER RELATIONS

57
Board, C. 1962 **The Border Region: natural environment and land use in the Eastern Cape.** Oxford University Press, Cape Town. 238 pp.
ENVIRONMENT, LAND USE, UTILISATION

58
Bolus, C. 1923 Key to the native trees and tree-shrubs of Kirstenbosch. **Journal of the Botanical Society of South Africa 9**:7-11
IDENTIFICATION AID

59
Bolus, H. & Wolley-Dodd, A.H. 1904 A list of the flowering plants and ferns of the Cape Peninsula, with notes on some of the critical species. **Transactions of the South African Philosophical Society 14**:207-373
DIVERSITY, FERN, FLORA, SPECIES LIST

60
Bond, W. 1983 On Alpha diversity and the richness of the Cape Flora: A Study in Southern Cape Fynbos. In: Kruger, F.J., Mitchell, D.T. & Jarvis, J.U.M. (eds.) 1983. **Mediterranean Type Ecosystems - the role of nutrients.** Ecological Studies 43. Springer-Verlag, Berlin. p.337-356
Alpha or within habitat diversity for fynbos in the non-seasonal rainfall areas of the southern Cape is compared with adjacent non-fynbos vegetation types, including evergreen forest, and a fynbos island within the forest. The fynbos island represented the lowest values, i.e. 5,0 species per 1 m^2, and 21 species per 0,1 ha plot. The forest represented values of 5,8 and 52 respectively, compared to 15,4 and 65,2 for proper fynbos sites.
DIVERSITY, FYNBOS, NUTRIENTS

61
Boucher, C. 1972 **The vegetation of the Cape Hangklip area.** Unpublished MSc thesis, University of Cape Town, Rondebosch.
COMMUNITY, FYNBOS, MONTANE, PHYTOSOCIOLOGY, SPECIES LIST

62
Boucher, C. 1974 Dune vegetation in the south-western Cape. **Veld and Flora 4**:67-69
COMMUNITY, DUNE

63
Boucher, C. 1978 The Cape Hangklip area. 2. The vegetation. **Bothalia 12**:455-497
Forests are described in the section on mountain vegetation, and include scree forest, kloof forest and shale forest.
COMMUNITY, FYNBOS, MONTANE, PHYTOSOCIOLOGY, SPECIES LIST

64
Boucher, C. & McDonald, A.E. 1982 **An inventory of plant communities recorded in the Western, Southern and Eastern Cape Province, South Africa up to the end of 1980.** South African National Scientific Programmes Report 57, C.S.I.R. Pretoria. 58 pp.

A comprehensive list is given of published and unpublished references to plant communities described by various authors. The list is divided into two sections: communities described over a wide geographical area, and communities described over a restricted area with localities indicated on a map.
COMMUNITY, FLORA, VEGETATION TYPE

65
Boucher, C. & Moll, E.J. 1981 South African Mediterranean shrublands. In: DiCastri, F., Goodall, D.W. & Specht, R.C. (eds.) **Mediterranean Type Shrublands.** Elsevir, Amsterdam. p.233-248
COMMUNITY, ENVIRONMENT, FYNBOS, VEGETATION TYPE

66
Bourquin, O. & Channing, A. 1980 Herpetofauna of the Natal Drakensberg: an annotated checklist. **Lammergeyer 30:**1-20
Records and notes the habitat (including forest) and distribution of frogs, lizards and snakes.
AMPHIBIAN, MONTANE, REPTILE, SPECIES LIST

67
Bourquin, O., Vincent, J. & Hutchins, P.M. 1971 The vertebrates of the Hluhluwe Game Reserve - Corridor (State land) - Umfolozi Game Reserve complex. **Lammergeyer 14:**1-119
Extensive patches of moist semi-deciduous forest occur in the higher northern section of Hluhluwe Game Reserve with rainfall 985 mm with wettest months October-January. In most cases the forest edges are sharply defined as a result of fires. The distribution of several amphibians, reptiles, mammals and birds in this forest area is mapped.
AMPHIBIAN, BIRD, FAUNA, FIRE, GRASSLAND, KLOOF, MAMMAL, REPTILE, VEGETATION TYPE

68
Braine, C.D.H. 1908 Influence of forests on natural water supply. **Report of the South African Association for the Advancement of Science 6:**111-133
HYDROLOGY

69
Brain, C.K. 1969 New evidence for climatic change during Middle and Late Stone age times. **South African Archaeological Bulletin 24:**127-143
ARCHAEOLOGY, CLIMATE, HISTORY, PALAEOECOLOGY

70
Bredenkamp, G.J. & Theron, G.K. 1978 A synecological account of the Suikerbosrand Nature Reserve. I. The phytosoiciology of the Witwatersrand geological system. **Bothalia 12:**513-529
The vegetation of the Witwatersrand System of the Suikerbosrand

Nature Reserve is analysed and classified according to the Braun-Blanquet Table Method. Descriptions of the plant communities include habitat features, differentiating species groups, as well as prominent and less conspicuous species of the tree, shrub and herbaceous layers. Kloof forest communities are found at an altitude of 1645-1715 m along seasonal streams in kloofs that are well sheltered by steep slopes. The soils are usually deeper than 1 m and rich in humus. A mosaic of evergreen broad sclerophyll forest and dry season deciduous forest occur. Two types of Rhus pyroides Forest are recognized.
COMMUNITY, ENVIRONMENT, HABITAT, KLOOF, PHYTOSOCIOLOGY, SPECIES LIST, VEGETATION TYPE

71
Bredenkamp, G.J. & Theron, G.K. 1980 A synecological account of the Suikerbosrand Nature Reserve. II. The phytosociology of the Ventersdorp Geological System. **Bothalia 13**:199-216
The vegetation of the Ventersdorp Geological System of the Suikerbosrand Nature Reserve is analysed and classified according to the Braun-Blanquet method. Descriptions of the plant communities include habitat features, identification of differentiating species groups as well as listing of prominent and less conspicuous species of tree, shrub and herbaceous layers. The dense Rhus pyroides-Rhamnus prinoides forest vegetation is mainly found in the sheltered kloofs within the study area. Isolated patches are found on steep south facing slopes. Two variants are distinguished.
COMMUNITY, ENVIRONMENT, HABITAT, KLOOF, PHYTOSOCIOLOGY, SPECIES LIST, VEGETATION TYPE

72
Breen, C.M. 1971 An account of the plant ecology of the dune forest at Lake Sibayi. **Transactions of the Royal Society of South Africa 39**:223-234
Location, frequency and climate of the dune forest in the vicinity of Lake Sibayi are given. General ecology of the forest, with particular reference to composition and density of trees and shrubs is outlined. Results are discussed in relation to survival of the most important canopy trees. It is concluded that the forest represents a stable vegetation type, i.e. Climax Dune Forest. A preliminary list of plants collected in the dune forest is appended.
COMMUNITY, DUNE, ENVIRONMENT, SPECIES LIST, VEGETATION STRUCTURE, VEGETATION TYPE

73
Breen, C.M. 1979 The dune forest: its structure and maintenance. In: Allanson, B.R. (ed.) **Lake Sibayi**. W. Junk, The Hague. p.21-33
COMMUNITY, DUNE, VEGETATION STRUCTURE

74
Breen, C.M. & Jones, I.D. 1971 A preliminary list of Angiosperms

collected in the vicinity of Lake Sibayi. **Transactions of the Royal Society of South Africa 39**:235-245
DUNE, SPECIES LIST

75
Brink, A.J. & Van der Zel, D.W. 1980 (The history of forestry in southern Africa. Part I: The indigenous forests) Die geskiedenis van bosbou in Suider-Afrika. Deel I: Die inheemse bosse. **South African Forestry Journal 114**:13-18
A good perspective of the past is a prerequisite for proper planning for the future. A general account is presented of the development of the forest and timber industry associated with the indigenous forests. Man's influence on this scarce resource is traced from the Late Stone Age through the extensive exploitation period at the beginning of the 20th Century to the present day when scientific management aims to reconstruct the remaining forest.
FORESTRY, HISTORY, MANAGEMENT, TIMBER, UTILISATION

76
Broekhuizsen, G.J. 1966 The avifauna of the Cape Protea-Heath Macchia habitat in South Africa. **Ostrich Supplement 6**:323-334
BIRD, FYNBOS

77
Broomberg, B. 1981 Some trees of the Royal Natal National Park. **Trees in South Africa 32**:104-107
A short account of the forest vegetation is given, together with a checklist.
MONTANE, SPECIES LIST

78
Broomberg, B. 1981 Preliminary survey of the trees of Empisini Nature Reserve. **Trees in South Africa 33**:55-56
A short discription is given of the reserve and interesting trees. A short species list is provided.
SPECIES LIST

79
Broomberg, B. 1982 Trees of the Trafalgar Area, South Coast, Natal. **Trees in South Africa 33**:98-99
SPECIES LIST

80
Brown, J.C. 1875 **Hydrology of South Africa.** Henry S. King & Co, London. 260 pp.
HYDROLOGY

81
Brown, J.C. 1877 **Water supply of South Africa and facilities for the storage of it.** Oliver and Boyd, Edinburgh.
HYDROLOGY

82
Brown, J.C. 1877 **Forests and moisture: or effects of forests on humidity of climate.** Oliver and Boyd, Edinburgh. 308 pp.
CLIMATE, ENVIRONMENT, HYDROLOGY

83
Brown, J.C. 1881 Forest in South Africa. **Transactions of the Royal Scottish Arboricultural Society 9**:45-52
DISTRIBUTION, PHYTOGEOGRAPHY, VEGETATION TYPE

84
Brown, J.C. 1887 **Management of Crown forests at the Cape of Good Hope under the old regime and under the new.** Oliver and Boyd, Edinburgh. 352 pp
HISTORY, MANAGEMENT, TIMBER, UTILISATION

85
Bruton, M.N. & Haacke, W.D. 1975 New reptile records from the tropical transition zone of south-east Africa. **Lammergeyer 27**:23-32
The collection sites and habitat preferences of reptiles collected in eastern Tongaland are given. The collection area includes climax coastal dune forest, coastal forest and swamp forest.
DUNE, ENVIRONMENT, REPTILE, SPECIES LIST, SWAMP, VEGETATION TYPE

86
Burton, R. 1914 **Report of an investigation of certain forests in Natal and Zululand.** South African Railways and Harbours report. Government Printer, Pretoria.
Descriptions of the following forests are given, together with prescriptions for exploitation for railway timber (sleepers and rolling stock): Xalangeni, Emkazeni, Ili, Ingeli, Impetyne, Ngomi, Qudeni and Nkandhla.
MANAGEMENT, SPECIES LIST, TIMBER, UTILISATION

87
Burton, A.J. 1957 Some apparatus and methods for quantitative ecological work. **South African Journal of Science 53**:206-208
METHODOLOGY

88
Burtt-Davy, J. 1905 The climate and life-zones of the Transvaal. **Report of the South African Association for the Advancement of Science 3**:531-538
CLIMATE, ENVIRONMENT, VEGETATION STRUCTURE, VEGETATION TYPE

89
Burtt-Davy, J. 1918 Additions and corrections to the recorded flora of the Transvaal and Swaziland. **South African Journal of Science 15**:570-571
FLORA

90
Burtt-Davy, J. 1926 **A manual of the flowering plants and ferns of the Transvaal with Swaziland, South Africa, Part 1.** Longmans, London. 272 pp.
FERN, FLORA, IDENTIFICATION AID

91
Burtt-Davy, J. 1932 **A manual of the flowering plants and ferns of the Transvaal with Swaziland, South Africa, Part 2.** Longmans, London. 257 pp.
FLORA, IDENTIFICATION AID

92
Butcher, A.R. 1961 Comment on germination of Stinkwood. **Journal of the South African Forestry Association 37**:23-24
AUTECOLOGY, PROPAGATION, REPRODUCTIVE BIOLOGY

93
Cameron, M.J. 1980 Fynbos islands in the Knysna forests. **South African Forestry Journal 112**:27-29
The origin of many of the patches of fynbos found within the Knysna forests can be attributed to man's activities. Exotic plantations have been established in many of these islands. The conversion of those that still exist to plantation management has recently caused a controversy as it is argued that very little is known about their origin and the role they play in the natural forest ecosystem. Research into the ecology of the islands can determine which management technique will best utilize their potential.
ENVIRONMENT, FYNBOS, HISTORY, MANAGEMENT, SUCCESSION

94
Cameron, M.J. 1982 Mountain and forest animals. In: Jordaan, J.V. (Ed.) **Saasveld 50:1932-1982.** Directorate of Forestry, Department of Environment Affairs, Pretoria. p.162-180
Invertebrates, fish, amphibia, reptiles, birds and mammals of indigenous forests are discussed in relation to their habitat and feeding requirements. Special mention is made of Red Data List species.
AMPHIBIAN, BIRD, CONSERVATION, FISH, HABITAT, HISTORY, INVERTEBRATE, MAMMAL, REPTILE

95
Campbell, B.M. & Moll, E.J. 1976 The forest communities of Table Mountain, South Africa. In: **The ecological status of Table Mountain.** University of Cape Town, Rondebosch. p.1-58
COMMUNITY, SPECIES LIST

96
Campbell, B.M. & Moll, E.J. 1977 The forest communities of Table Mountain, South Africa. **Vegetatio 34**:105-115

The forest communities of Table Mountain have been classified using the Braun-Blanquet technique together with numerical analysis. Three major communities, termed associations, have been recognised. Some of these associations have been subdivided. Each community has been described in terms of floristic, structural and environmental factors. The dominant factors affecting the distribution of forest communities appear to be moisture conditions, soil rockiness and soil depth. Information from other south-western Cape forest areas is discussed. The forests from Table Mountain are similar to these. However, two forest communities are not found on the Cape Peninsula and extensive areas of Cassine dominated forest on deep soils referred to as Scolopia mundii - Cassine capensis variant do not appear to be found outside Orange Kloof.
COMMUNITY, ENVIRONMENT, PHYTOSOCIOLOGY, SPECIES LIST

97
Campbell, G.K. 1966 Woody plants of the Kenneth Stainbank Nature Reserve, Durban. **Lammergeyer 6**:47-62
The Reserve, 120 ha of coast forest and grassland, 30-150 m a.s.l. in the southwestern part of Durban, constitutes the largest area of climax Coast forest in the vicinity of Durban. A brief description of the climatic, geographic and historic factors related to the protection of this Reserve is provided. Some notes are provided on trees planted within the reserve. An annotated checklist gives information on the species of the area.
CONSERVATION, HISTORY, MANAGEMENT, SPECIES LIST, SUCCESSION, VEGETATION TYPE

98
Cardew, F. 1891 **Report on the forests of Zululand.** Colonial Report, Miscellaneous Series 2. 25 pp.
FLORA, VEGETATION TYPE

99
Cawe, S., McKenzie, B. & Granger, J.E. 1983 **A reconnaissance vegetation survey of a part of coastal Pondoland.** Botany Department, University of Transkei, Umtata.
The conservation status, history, geology and climate of the area are outlined. The vegetation survey involved analysis of 1:20 000 air photographs and ground verification of mapping units. The description of the vegetation units (including dune, marsh, mangrove and lowland forest types) is illustrated with profile diagrams and photographs, and includes lists of the common trees, shrubs, creepers and forbs. Summary tables list name, size, condition and timber trees of each forest.
CONSERVATION, ENVIRONMENT, FLORA, INVENTORY, MAP, SPECIES LIST, TIMBER, VEGETATION STRUCTURE

100
Clark, J.V. 1970 Observations on the Crowned Eagle Polemaetus coronatus. **Lammergeyer 12**:74-77

Nesting of this bird in the Krantzkloof Nature Reserve in Natal and interaction between the bird and the vervet monkey are recorded.
BIRD, HABITAT, INTERACTION, MAMMAL

101
Cody, M.L. 1983 Bird diversity and density in South African forests. **Oecologia 59**:201-215
The paper reports on a study of birds in five forests between the Cape Peninsula and Alexandria. Although bird species numbers decline from east to west from 43 to 15, total bird density remains roughly constant and bird density per species increases threefold. The variation in abundance of frugivores, seedeaters, nectarivores, flycatchers, etc. is discussed.
BIRD, DIVERSITY, SPECIES LIST

102
Coetzee, B.J. 1974 A phytosociological classification of the vegetation of the Jack Scott Nature Reserve. **Bothalia 11**:329-347
The vegetation of this reserve near Pretoria is classified chiefly by the Braun-Blanquet Table Method. Habitat features, physiognomy, total floristic composition, differentiating species, woody plants, etc. are presented for each community. Riparian and kloof forests are found along streams that are sheltered by high, steep slopes on deep soils at the foot of krantzes, or on steep slopes in sheltered kloofs. The vegetation includes evergreen broad sclerophyll forest with Olea europaea subsp. africana as dominant tree species, and dry-season deciduous forest.
COMMUNITY, ENVIRONMENT, KLOOF, PHYTOSOCIOLOGY, VEGETATION STRUCTURE

103
Coetzee, B.J. 1975 A phytosociological classification of the Rustenburg Nature Reserve. **Bothalia 11**:561-580
The vegetation of the Rustenburg Nature Reserve, situated on the Magaliesberg in Acocks' (1953) Sour Bushveld Veld Type of South Africa, is classified by the Braun-Blanquet Method. Five major vegetation types are described floristically, physiognomically and in terms of habitat features. Small patches of Hypoestes verticillaris - Mimusops zeyheri forests occur in kloofs. The forest is subdivided into distinct types: Ilex mitis - Pittosporum viridiflorum forest occurs in narrow east-facing kloofs with perrenial streams or water near the surface. The dominant tree stratum is 5 to 13 m tall. Blechnum giganteum is the dominant forb. Acalypha glabrata- Dombeya rotundifolia forest occurs in sheltered, but drier kloofs with no surface water or free ground water near surface with two types: Diospyros whyteana - Celtis africana forest in relatively cool kloofs of various aspects with upper stratum 5-12 m tall; and the Ficus pretoriae - Urera tenax forest which is only 2-5m tall.
COMMUNITY, ENVIRONMENT, KLOOF, PHYTOSOCIOLOGY, VEGETATION STRUCTURE

104
Coetzee, B.J. 1980 Classification is instructive. **Koedoe 23**:33-34
Comments on a published table of antelope habitat preferences.
HABITAT, MAMMAL, METHODOLOGY

105
Coetzee, B.J., Van Wyk, P., Gertenbach, W.P.D., Hall-Martin, A. & Joubert, S.C.J. 1981 A plant ecological reconnaissance of the Waterberg area in the Northern Transvaal bushveld. **Koedoe 24**:1-23
The Waterberg area occurs in the Zambezian Domain with seasonal summer rain. Small Kloof forests represent the Afromontane elements and vary according to temperature and moisture regime. Dry-warm, moist-warm, dry-cool and moist-cool combinations occur. A typical sour Bushveld kloof forest in a cool, deep kloof of southeastern aspect without running water and a dry, warm kloof forest of western aspect, without running water are described. Warm kloofs with running water are abundant, but not investigated.
CLIMATE, COMMUNITY, ENVIRONMENT, KLOOF, SPECIES LIST

106
Coetzee, B.J. & Werger, M.J.A. 1973 On hierarchical syndrome analysis and the Zurich-Montpellier Table Method. **Bothalia 11**:159-164
The analyses were carried out on two sets of data from Swartbosch-kloof in Jonkershoek, Stellenbosch, including forest vegetation dominated by Rapanea melanophloeos.
COMMUNITY, METHODOLOGY, PHYTOSOCIOLOGY

107
Coetzee, J.A. 1978 Late Cainozoic palaeoenvironments of southern Africa. In: Van Zinderen Bakker, E.M. (ed.). **Antarctic glacial history and world palaeoenvironments.** Balkema, Rotterdam. pp.89-140
Microflora from a number of buried channels in the southwestern Cape which preserve a discontinuous record probably from the Oligocene through to the Pleistocene is reported on. An alternating succession of pollen assemblages has been documented primarily from the Noordhoek core that suggests marked changes between palm dominated vegetation and forest with Podocarpaceae and other forest taxa.
PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

108
Coetzee, J.A. 1983 Intimations on the Tertiary vegetation of southern Africa. **Bothalia 14**:345-354
Fossil pollen sequences from the Cape Peninsula and the Saldanha region indicate that sub-tropical vegetation and climates existed in these regions during the Miocene. The pollen record from the Cape Peninsula may point to the extinction of some taxa by the terminal Miocene/Early Pliocene with the subsequent strong development of macchia. The pollen evidence shows that in both areas, particu-

larly at Noordhoek, mixed coniferous forest (including Podocarpus) with tropical elements including several different palms, were more prominent during certain times while palms became dominant during other periods.
PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

109
Coetzee, J.A. & Van Zinderen-Bakker, E.M. 1970 Palaeoecological problems of the Quaternary of Africa. **South African Journal of Science 66**:78-84
PALAEOECOLOGY

110
Comins, D.M. 1962 The vegetation of the districts of East London and King William's Town, Cape Province. **Memoirs of the Botanical Survey of South Africa 33**:1-32
The section on woodlands includes Scrub, Gully Bush and Riverine Bush, Coast Dune Bush and Forest. Forest is sub-divided into Dry Forest, Cut-over Forest and Moist Forest.
DUNE, RIVERINE, SUCCESSION, UTILISATION, VEGETATION TYPE

111
Cooke, H.B.S. 1962 The Pleistocene environment in South Africa: hypothetical vegetation in southern Africa during the Pleistocene. **Annals of the Cape Provincial Museum 2**:11-15
CLIMATE, ENVIRONMENT, PALAEOECOLOGY, VEGETATION CHANGE, VEGETATION TYPE

112
Cooke, H.B.S. 1964 The Pleistocene environment in South Africa. In Davis, D.H.S. (ed.) **Ecological studies in South Africa.** W. Junk, The Hague. p.1-23
The paper discusses the hypothetical vegetation pattern, including forest vegetation, which might be expected to result from increased or decreased rainfall during the Pleistocene.
CLIMATE, PALAEOECOLOGY, VEGETATION CHANGE, VEGETATION TYPE

113
Cooper, K.H. & Moll, E.J. 1966 Hlogwene forest. **African Wildlife 20**:321-326
FLORA

114
Cooper, K.H. & Moll, E.J. 1968 Notes on an area of the Karkloof forest, Natal. **African Wildlife 22**:49-57
ENVIRONMENT, FLORA

115
Cowling, R.M. 1982 **Vegetation studies in the Humansdorp region of the fynbos biome.** PhD thesis, University of Cape Town, Rondebosch.
ENVIRONMENT, FLORA, INTERACTION, PHYTOGEOGRAPHY, PHYTOSOCIOLOGY

116
Cowling, R.M. 1983 Diversity relations in Cape shrublands and other vegetation in the southeastern Cape, South Africa. **Vegetatio 54**:103-127
DIVERSITY, VEGETATION STRUCTURE

117
Cowling, R.M. 1983 Phytochorology and vegetation history in the southeastern Cape, South Africa. **Journal of Biogeography 10**:393-419
CLIMATE, PHYTOGEOGRAPHY

118
Cowling, R.M. & McKenzie, B. 1979 The conservation status of the Keiskamma River Mouth Region. **The Eastern Cape Naturalist 66**:28-30
The section on terrestrial vegetation includes Dune Forest and Alluvium Forest.
COMMUNITY, CONSERVATION, DUNE

119
Cowling, R.M. & Campbell, B.M. 1983 The definition of leaf consistence categories in the fynbos biome and their distribution along an altitudinal gradient in the south-eastern Cape. **Journal of South African Botany 49**:87-101
Leaf consistence is a morphological feature which is used as attribute for structural classification of communities and for evolutionary interpretation of plant form and function. In this paper criteria for the subjective characterisation of leaf consistence by "feel" are tested by determining indices of sclerophylly and succulence on leaves classed on a priori basis as sclerophyll, orthophyll, fleshy, or succulent. Results show differences in degree of sclerophylly (leaf dry weight per unit leaf area) and degree of succulence (maximal water content per unit leaf area) among the subjectively determined categories. The adaptive significance of the leaf consistence categories is indicated by direct gradient analysis of two parallel transects in the southeastern Cape, one in fynbos, the other in non-fynbos (including Afromontane forest) vegetation. In non-fynbos changes in leaf consistence along the gradient are interpreted largely as a response to changes in climate and soil moisture. The predominance of sclerophyll leaves throughout the fynbos gradient is interpreted as a response to low soil fertility.
ENVIRONMENT, EVOLUTION, METHODOLOGY, MORPHOLOGY, NUTRIENTS, VEGETATION STRUCTURE

120
Craib, I.J. 1929 Moisture versus light as the limiting factor in forest development. **South African Journal of Science 26**:247-257
ENVIRONMENT, LIGHT, WATER RELATIONS

121
Cronin, M. 1982 Radiocarbon dates for the Early Iron Age in Transkei. **South African Journal of Science 78**:38-39
The Mpame midden in the Elliotdale district, dating to 700 years A.D. represents remains of hunting, fishing and shell collecting activities. Remains of blue duiker (Cephalophus monticola), bushpig (Potamochoerus porcus) and monkey (Cercopithecus sp.) demonstrate that coastal forests were nearby at the time the site was used. These forests still occur in patches along the Bomvanaland coast today.
ARCHAEOLOGY, CLIMATE, MAMMAL, VEGETATION CHANGE

122
Curtis, B.A., Tyson, P.D. & Dyer, T.G.J. 1978 Dendrochronological age determination of Podocarpus falcatus. **South African Journal of Science 74**:92-95
A method for dating Podocarpus falcatus is presented. Age determination by ring counting on cores and along radii of a whole-trunk section is shown to be untenable, owing to the occurrence of missing and false rings. Instead a method of mapping the ring structures for whole trunk sections is presented. From the demarcated rings age can be estimated.
DENDROCHRONOLOGY, METHODOLOGY,

123
Darnell, B.H. 1973 The great forest and veld fire of 1869. **Looking Back 23**(2):43-44
This is the text of a letter about this fire by Mr Darnell who was living at Knysna at the time. The fire devastated the area between Riversdale and Uitenhage.
DISTURBANCE, FIRE, HISTORY

124
Darrow, W.K. 1973 **Forestry in the Eastern Cape Border Region.** Bulletin 51, Department of Forestry, Pretoria. 99 pp.
The paper describes the destruction of indigenous forests first by Bushmen and Hottentots, then by invading Ama-Xhosa from the north and finally by white settlers from the south. The steps taken by the Department of Forestry to halt the destruction of these forests and start on their rehabilitation are described. This had led to the introduction of suitable, fast-growing exotic softwood tree species.
FORESTRY, HISTORY, MANAGEMENT, UTILISATION

125
Deacon, H.J. 1983 The comparative evolution of Mediterranean-Type Ecosystems: A southern perspective. In: Kruger, F.J., Mitchell, D.T. & Jarvis, J.U.M. (eds.) **Mediterranean-Type Ecosystems - the role of nutrients.** Ecological Studies 43. Springer-Verlag, Berlin. p.3-40
Some aspects of climatic and vegetation change is discussed, with specific emphasis on southern Australia and southern Africa to

illustrate the kind of information currently available for comparing the selective pressures that have contributed to the evolution of the mediterranean-type ecosystems. Several data sources suggest a much larger area having been forested during the Cenozoic, although forest was not necessarily continuous. Pleistocene and Holocene expansion and decline of forest are discussed.
CLIMATE, EVOLUTION, FYNBOS, PALAEOECOLOGY, PHYTOGEOGRAPHY, VEGETATION CHANGE, VEGETATION STRUCTURE

126
Deacon, H.J., Hendy, Q.B. & Lambrechts, J.J.N. (eds.) 1983 **Fynbos Palaeoecology : a preliminary synthesis.** South African National Scientific Programmes Report 74, C.S.I.R. Pretoria. 216 pp.
Current knowledge of aspects of the geology, soils and palaeontology relevant to the study of the palaeoecology of the fynbos region, the southern margin of the African continent, is surveyd in nine essays and three introductory reviews, Precambrian sediments, granites and rocks of the early Phanerozoic Cape Supergroup, underlie the greater part of the region and the distribution of the main rock units is shown on an accompanying map. The main physiographic features were established by folding during the Cape orogeny (278-215 Myr) and by subsequent erosion and faulting, in part associated with the outlining of the continental margin at the end of the Jurassic (140 Myr). The Cenozoic deposits (0-65 Myr) are discussed in a synopsis of the evolution of the modern landscape. Soils as indicators of palaeoenvironments are reviewed and a description and maps of soils of the Cape coastal platform are included. The palaeontological record as known from the study of the late Tertiary vertebrates. Quarternary large and small mammals, Cretaceous and Cenozoic plant microfossils and macrofossils is described and the palaeoenvironmental implications are reviewed. The history of human occupation of the region is put into perspective. Various chapters refer to the occurrence of forests as revealed by plant/pollen and charcoal, and faunal bones in various study sites.
ARCHAEOLOGY, CLIMATE, FYNBOS, HISTORY, PALAEOECOLOGY, VEGETATION CHANGE

127
Dean, W.R.J. 1983 **The use of Solanum mauritianum woodlands by birds in the northeastern Transvaal.** Proceedings of the Symposium on Birds and Man. South African Ornithological Society and Wits Bird Club, April 1983, Johannesburg.
BIRD, CONSERVATION, DISPERSAL, EXOTIC, HABITAT

128
De Graaff, G. 1981 **The rodents of southern Africa.** Butterworths, Durban. 267 pp.
The book includes taxonomic descriptions of the species with notes on distribution, diet, habits, habitat, predators, reproduction,

parasites and prehistory.
HABITAT, MAMMAL, SPECIES LIST

129
De Winter, B. 1973 South African trees. **South African Forestry Journal 88**:6-8
The true forest and kloof forest species of the eastern coast and escarpment of South Africa show very marked affinities with similar vegetation types of the eastern coast of Africa northwards to Abyssinia. South-western Cape species, however, are mostly endemics with fairly limited distributions.
FLORA, ORIGIN, PHYTOGEOGRAPHY

130
Dodd, M.C. & Van Staden, J. 1981 Germination and viability studies on the seeds of Podocarpus henkelii Stapf. **South African Journal of Science 17**:171-174
Mature seeds of Podocarpus henkelii had a high moisture content of 62% and germinated readily after scarification and incubation at 25°C, even without water. These seeds were very susceptible to desiccation and required additional water for germination after a period of storage. The epimatium restricts water uptake to seed tissues and thus limits germination. The seeds are capable of photosynthesis and are thus able to supplement their food reserves after falling from the tree. During storage dry mass of the embryo sporophyte increased, indicating that it was still growing.
AUTECOLOGY, FRUIT, PROPAGATION, REPRODUCTIVE BIOLOGY

131
Doidge, E.M. 1950 The South African Fungi and Lichens. **Bothalia 5**:1-1094
FUNGI, IDENTIFICATION AID, LICHEN, TAXONOMY

132
Dommisse, E.J. 1951 The Knysna elephants - historical sketch of a world-famous herd. **African Wildlife 5**:195-201
HISTORY, MAMMAL

133
Donald, D.G.M. & Theron, J.M. 1983 Temperate evergreen broad-leaved forests of Africa south of the Sahara. In: Ovington, J.D. (ed.) **Temperate Broadleaved Evergreen Forests.** Elsevier, Amsterdam. p.135-168
This forest formation is defined and described. The forests are distributed along the Afromontane archipelago in seven regional montain systems between Ethiopia and the Southern Cape. The range covers a diversity of soil types and climatic zones, but only in the Southern Cape is the annual rainfall less than 1200 mm. Floristically these widely separated forest islands differ greatly from the surrounding vegetation but are similar to one another. Eight species including Apodytes, Ilex, Nuxia, Prunus and Rapanea

are common to all the forests. Distribution of understorey species and forest fauna are discussed and information on forest functional processes, utilization, management and conservation status are reviewed.
CONSERVATION, DISTRIBUTION, ENVIRONMENT, FAUNA, FLORA, MANAGEMENT, PHYTOGEOGRAPHY, UTILISATION

134
Downing, B.H. 1980 Changes in the vegetation of Hluhluwe Game Reserve, Zululand, as regulated by edaphic and biotic factors over 36 years. **Journal of South African Botany 46**:225-231
Examination of two sets of vegetation data showed a 5% increase in the extent of evergreen closed forest in the Reserve during the period 1937 to 1974. A corresponding decrease of 8% was found in the extent of grassland. A considerable increase in the woody element of the vegetation at the expense of the herbaceous layer, particularly grasses, was evident. These changes were mostly confined to upland areas and were ascribed to possible differences in burning treatments applied over the period. No significant changes were found in the extent of lowland communities where soils were primarily responsible for community distribution. J.S. Henkel (unpublished report on the plant and animal ecology of the Reserve with special reference to Tsetse flies) mentioned that the dense abrupt forest margins were not damaged by fires which regularly burned through the adjacent grassland and parklands. Recently, however, fire damage has been observed.
FIRE, GRASSLAND, MANAGEMENT, SOIL, VEGETATION CHANGE, VEGETATION TYPE

135
Duthie, A.V. 1929 Vegetation and flora of the Stellenbosch Flats. **Annals of the University of Stellenbosch 7**(4):1-59
The description includes fringing forest of river banks.
COMMUNITY, FLORA, RIVERINE, SPECIES LIST

136
Duthie, B. 1978 Hawaan Forest. **Trees in South Africa 30**:77-80
A short description is given of the forest. Interesting plants and animals are noted. A list is given of the trees and climbers.
FAUNA, FLORA, SPECIES LIST

137
Dyer, R.A. 1937 The vegetation of the divisions of Albany and Bathurst. **Memoirs of the Botanical Survey of South Africa 17**:1-138
A section on scrub, inland scrub, bush and low scrub is included.
COMMUNITY, FLORA, SPECIES LIST, VEGETATION TYPE

138
Earle, R.A. 1983 Foraging overlap and morphological similarity among some insectivorous arboreal birds in an Eastern Transvaal forest. **Ostrich 54**:36-42

Foraging niches of eight common insectivorous bird species were studied in an evergreen forest on the Ceylon State Forest, Sabie, for 16 months. The forest patch was reasonably flat, 60-90 m wide and at the bottom of a kloof. Three bird species were much larger than the remaining five (by 200%) and were not considered to be in competition with the smaller ones. This excluded the Barthroated Apalis (Apalis thoracica, <12 g) and the Olive Bush Shrike (Telophorus olivaceus 30 g) as being competitors although both species foraged mainly on the bark of twigs. The Yellowstreaked Bulbul (Phyllastrephus flavostriatus) and the Olive Woodpecker (Mesopsicos griseocephalus) which mainly use the same foraging site and method are morphologically so dissimilar that they are probably not in competition. They were often seen together and even foraged in exactly the same spot. The Yellowthroated Warbler (Seicercus ruficapillus) and the Cape White-eye (Zosterops pallidus) overlapped in both foraging site and method but Zosterops is partly frugivorous which probably reduces competition between these two morphologically similar species. All the species avoided foraging at about 3 m where there was a dense layer of vegetation. Species foraging on the bark of branches and twigs used the whole height of the forest while species foraging on leaves had more definite peak foraging heights.
BIRD, HABITAT, INTERACTION, VEGETATION STRUCTURE

139
Earle, R.A. 1983 Notes on bird parties in some Transvaal indigenous forests. **Ostrich 54**:176-178
The presence and composition of mixed bird parties in indigenous forests of the Transvaal are recorded. Bird parties were seen in Maritzbos, Woodbush and Entabeni forests. All three forests had a continuous canopy 15-20 m high. Bird parties were seen only during the winter months (Apr-Sept) which was attributed to a probable adaptation to low food abundance.
BEHAVIOUR, BIRD, VEGETATION STRUCTURE

140
Earle, R.A. & Oatley, T.B. 1983 Populations, ecology and breeding of the Orange Thrush at two sites in eastern South Africa. **Ostrich 54**:205-212
The birds were studied in the indigenous forests of Maritzbos on the Transvaal Escarpment and Two Streams in the Karkloof area, Natal. Food seemed to be a major factor in regulating the winter population size of both the Orange Thrush and the Olive Thrush in the Transvaal forest as the number of earthworms showed a peak just before the bird numbers peaked. In Natal the Orange Thrush showed a higher degree of specialization in diet then the Olive Thrush which has a mixed diet. The Orange Thrush preferred areas in the forest where little vegetation occurred at 1,0-1,5 m and where a good layer of litter was present.
BEHAVIOUR, BIRD, HABITAT, INTERACTION, LITTER, VEGETATION STRUCTURE

141
Edwards, D. 1967 A plant ecological survey of the Tugela River Basin. **Memoirs of the Botanical Survey of South Africa 36**:1-285
The memoir gives overall and detailed accounts of the distribution, climate, soil, history and utilization of the vegetation of the coast, valley, uplands and montain regions of Natal. Evergreen forest types described include swamp and coastal forest, upland transitional forest, mistbelt and mountain Podocarpus forest. Species lists are provided for each vegetation type, and the work is illustrated with maps and photographs.
CLIMATE, COMMUNITY, ENVIRONMENT, HISTORY, SOILS, SPECIES LIST, UTILISATION, VEGETATION TYPE

142
Edwards, D. 1974 Survey to determine the adequacy of existing conserved areas in relation to vegetation types. A preliminary report. **Koedoe 17**:3-38
The report is a broad survey of the conservation status of South African vegetation. Data and maps show the distribution and total areas of lands conserved by the various conservation agencies, the size and structure of nature reserves, the areas and percentages of conserved areas in relation to the 70 veld types and 7 main vegetation types of Acocks, and important conservation requirements in the Homelands. Major conservation deficiencies lie in the Karoo, Karroid bushveld and Grassland Types where 423 veld types are virtually unconserved, and in Tropical Bush and Savanna.
CONSERVATION, VEGETATION TYPE

143
Eicker, A. 1968 **An ecological survey of the soil and mycoflora of two forest communities in Zululand.** Unpublished DSc thesis, University of Potchefstroom, Potchefstroom.
FUNGI, SOIL

144
Endrody-Younga, S. & Peck, S.B. 1983 Onychophora from mesic grassveld in South Africa (Onychophora:Peripatopsidae). **Annals of the Transvaal Museum 33(23)**:347-352.
Populations of Peripatopsis moseleyi (Wood-Mason, 1879) and P. capensis (Grube, 1866) were found in open grassland near Cathedral Peak (Natal) and in the Langeberg (Cape) respectively. The literature on the biology, physiology, ecology and distribution of South African Onychophora is reviewed. It is concluded that the observed populations are relics which continue to survive after forests have contracted due to past climatic changes in southern Africa.
CLIMATE, GRASSLAND, HABITAT, INVERTEBRATE, PALAEOECOLOGY, VEGETATION CHANGE

145
Esterhuysen, E.E. 1936 Regeneration after clearing at Kirstenbosch. **Journal of South African Botany 2**:117-185
MANAGEMENT, REGENERATION, SUCCESSION

146
Feely, J.M. 1980 Did iron age man have a role in the history of Zululand's wilderness landscapes ? **South African Journal of Science 76**:150-152
In the light of recent discoveries that iron age people lived in Zululand at least 1 600 years ago, the author questions the validity of assuming that all the open Savanna Woodlands are natural. The paper suggests that much of the open woodland in Zululand and the Transvaal lowveld were derived from previously closed woodland or forest under the influence of iron age man.
ARCHAEOLOGY, HISTORY, VEGETATION CHANGE

147
Forbes, H. 1922 The flora of Isipingo. **South African Journal of Science 18**:348-358
Lists of species are provided for the various vegetation communities, including forest, found in the area.
FLORA, SPECIES LIST

148
Forbes, H.M.L. 1923 A note on the flora of Salisbury Island (Durban Bay). **South African Journal of Science 20**:304-308
A short note is given of the three distinct types of vegetation, i.e. dense mangrove swamp, coast bush and inland bush. A complete list of the plants collected on the island is appended.
FLORA, SPECIES LIST, VEGETATION TYPE

149
Fourcade, H.G. 1889 **Report on the forests of Natal.** Natal Blue Book. W. Watson, Pietermaritzburg.
DISTRIBUTION, UTILISATION

150
Fourcade, H.G. 1941 Check-list of the flowering plants of the divisions of George, Knysna, Humansdorp and Uniondale. **Memoirs of the Botanical Survey of South Africa 20**:1-127
A total of 2 969 native and 166 alien species are listed for the total area of 14 000 km^2. The divisions in which a species occur are noted.
FLORA, SPECIES LIST

151
Fox, F.W. & Norwood Young, M.E. 1982 **Food from the veld** - edible wild plants of southern Africa botanically identified and described. Delta Books, Johannesburg. 400 pp.
Only plants eaten by man are described, including their distribution and uses. The plants, however, feed a great many animals.

FRUIT, IDENTIFICATION AID, NUTRIENTS, REPRODUCTIVE BIOLOGY, UTILISATION

152
Frost, P.G.H. 1980 Fruit-frugivore interactions in a South African coastal dune forest. In: Nohring, R. (ed.) **Acta 17. Congressum Internationalen Ornithologiai Band II.** Verlag Deutschen Ornithologen-Gesellschaft, Berlin. p.1179-1184
The paper summarises research into the nature and extent of fruit-frugivore interactions in an evergreen coastal dune forest near Mtunzini. The aim was to determine some of the coevolutionary relationships between the forest trees and their avian dispersal agents. Data presented are based on 482 hrs observation on 15 of the tree species. Of 103 non-predatory bird species recorded, 35 were seen eating fruit. Frequency and duration of visitation and feeding rates of birds were recorded at exposed trees. Fruit crop sizes and chemical composition were recorded. Fruiting takes place throughout the year, with a distinct peak during the dry season and a trough in the early wet season. The reliance by most of the tree species on a relatively narrow suite of frugivores involves potential interspecific competition for dispersal agents, also reflected by the variations in fruit quality.
BIRD, DISPERSAL, DUNE, FRUIT, INTERACTION, NUTRIENTS

153
Gamble, J.S. 1880 A forester's short trip to the Cape Peninsula. **Indian Forester 16**:431-444
COMMUNITY

154
Garland, I. 1981 The dilemma of survival - The heritage of Natal forests and their value to the environment. **Trees in South Africa 33**:30-37
Man's impact on the environment and particularly the climax forests of Natal is briefly reviewed. The value of the forests and needs to educate the population are stressed. The forests are divided into nine main climax ecosystems.
CONSERVATION, HISTORY, MANAGEMENT

155
Geertsema, H. 1964 The Keurboom moth Leto venus Stoll Order: Lepidoptera (Hepialidae). **Forestry in South Africa 5**:55-59
This moth, also known as the Silver Ghost Moth, is found in the George-Knysna forests where its larvae attack standing Keurboom (Virgilia oroboides). The extent of the damage caused by the larva and its role in the ecology of the forest is discussed. The taxonomic position, a short description of the various stages and its life history are given.
AUTECOLOGY, DISTRIBUTION, INTERACTION, INVERTEBRATE

156
Geldenhuys, C.J. 1975 (The artificial establishment of indigenous

forest in the Southern Cape.) Die kunsmatige vestiging van inheemse bos in die Suid-Kaap. **Forestry in South Africa 16**:45-53

The experimental establishment of ten of the more important tree species of the Southern Cape indigenous forest according to the Taungya system in a single plot in the Diepwalle forest near Knysna is discussed. This experiment has led to the successful establishment of the indigenous forest on an area adjacent to the forest, but bare of forest tree species for about 50 years. The area was ploughed and the trees planted between cultivated vegetables. The cultivation and hoeing during the first three years improved survival and height growth of most of the species during the first seven years. Faster growing species, however, suppressed slower species by their larger crowns. Growth rate and position in the canopy are given for different species. The stand density of 1 700 stems per ha is more than double the number of stems, and the basal area of 46,85 m^2 ha much higher than the basal area in parts of Diepwalle forest under production management. This crowding has led to a decrease in basal area increment over the last 10-15 years.

DENSITY, GROWTH, MANAGEMENT, PROPAGATION, REGENERATION

157

Geldenhuys, C.J. 1975 **Raising indigenous trees.** Pamphlet 150. Department of Forestry, Pretoria.

Information on raising 101 indigenous tree species from the Southern Cape and Transvaal for use in parks and gardens is provided in tabular form, and includes mature size, growth rate, seed life, sowing time, seed treatment, germination period, vegetative methods, sensitivity to frost and general remarks for specific species as well as general information on choice of site, soil requirements, seed treatment and vegetative methods.

GROWTH, PROPAGATION, REPRODUCTIVE BIOLOGY

158

Geldenhuys, C.J. 1975 (The autecology of Podocarpus falcatus.) **Die Autecology van Podocarpus falcatus.** Unpublished MSc (Forestry) thesis, University of Stellenbosch, Stellenbosch.

AUTECOLOGY, DEMOGRAPHY, DISPERSAL, DISTRIBUTION, FRUIT, GROWTH, PROPAGATION, REGENERATION, REPRODUCTIVE BIOLOGY, ROOTS

159

Geldenhuys, C.J. 1977 (The increment of Ptaeroxylon obliquum in the Alexandria forest, Eastern Cape.) Die aanwas van Ptaeroxylon obliquum in die Alexandriabos, Oos-Kaap. **South African Forestry Journal 102**:83-87

Increment data for Ptaeroxylon obliquum (sneezewood) in a single plot in the Alexandria forest were analysed. Results show significant differences in the relationship between D.B.H. and basal area increment during various measurement periods. The average increment decreases with increasing age of the stand.

AUTECOLOGY, GROWTH

160
Geldenhuys, C.J. 1980 The effect of management for timber production on floristics and growing stock in the Southern Cape indigenous forests. **South African Forestry Journal 113**:6-15, 25
The present selection system for management and harvesting in the Southern Cape indigenous forests is discussed in relation to silvicultural systems used in tropical high forests in various countries and to the historical development of indigenous forest policy and management in the Southern Cape. Approximation of the normal basal area distribution for forests under management for production of timber is described. A removal preference index was calculated to investigate the effect of the system for marking of removable surplus growing stock on species composition and size class distribution of the forest in three compartments. Several species have been over-exploited in one or more compartments, e.g. Canthium obovatum, Olea capensis subsp. macrocarpa, Burchellia bubalina, Maytenus peduncularis and Ocotea bullata. Only two common species, Pterocelastrus tricuspidatus and Curtisia dentata, were consistently marked below the level of equal selection. Often trees other than the old trees were removed. Recommendations are made for improvement of the present marking system.
DEMOGRAPHY, DENSITY, MANAGEMENT, TIMBER, UTILISATION

161
Geldenhuys, C.J. 1981 (Silky bark species in the Southern Cape.) Sybassoorte in Suid-Kaapland. **South African Forestry Journal 116**:96-98
The differences between the leaves and fruit and the site requirements of Maytenus acuminata and Cassine eucleiformis are discussed.
FRUIT, HABITAT, IDENTIFICATION AID, TAXONOMY

162
Geldenhuys, C.J. 1981 Prunus africana in the Bloukrans River Gorge, Southern Cape. **South African Forestry Journal 118**:61-66
The decline of Prunus africana in the most southern end of its distribution is attributed to unsuitable establishment conditions for seedlings and adverse climatic conditions. Only 43 trees over 100 mm D.B.H. occur of which 47% are dead. The trees grow low down near streams in the sheltered river gorge on warmer northeastern slopes on the more fertile shale band. Seedlings establish only on bare soil caused by road collapse or other exposed sites with sufficient moisture on northeastern slope within otherwise steady-state, all-aged closed forest.
AUTECOLOGY, DEMOGRAPHY, DISTRIBUTION, HABITAT, REGENERATION, REPRODUCTIVE BIOLOGY

163
Geldenhuys, C.J. 1982 The culling of large, non-utilisable trees in the Southern Cape forests. **South African Forestry Journal 120**:55-62

The killing of large, non-utilisable trees is a management problem in the Southern Cape forests. This paper reports on an experiment carried out to compare ring-barking and 3% and 6% 2,4,5-T in diesoline. The main species treated were Olea capensis subsp. macrocarpa and Canthium obovatum. In general, ring-barking and chemical treatment do not differ significantly. The species, size of tree and season of treatment, however, interacted with the treatments. It is suggested that the trees should be killed by ring-barking. Recommendations are provided for effective ring-barking.
CULLING, HERBICIDES, MANAGEMENT

164
Geldenhuys, C.J. 1982 The management of the Southern Cape forests. **South African Forestry Journal 121**:4-10
Sustained timber production is related to the consequences of the marginal Southern Cape environment for rainforest. The environment and vegetation is briefly described. The unevenaged, mixed nature of the forest and the lack of major disturbances are discussed in relation to the present single tree selection system. The policy in implementing a multiple-use conservation management system is outlined. The methods of stock enumeration, management planning, and yield regulation are described. Brief notes are provided on the methods used for marking, felling, killing, slipping and auctioning of the timber. Methods of reconstruction of forest fringes and the recreation system are discussed.
ENVIRONMENT, MANAGEMENT, METHODOLOGY, RECREATION, REGENERATION, TIMBER, UTILISATION

165
Geldenhuys, C.J. 1983 A critical evaluation of indigenous forest management. Proceedings of the Jubilee Symposia, University of Stellenbosch. **Foris 98**:497-524
The management of indigenous evergreen forests in South Africa is considered in the context of regional land use practices, in relation to the multiple use system on State Forest Land in the Southern Cape, and as a potential for private owners with limited financial resources. It is argued that the forest should receive the required status and protection in regional development schemes. Its direct values in sustained production of major and minor forest products, its unique environment for recreation, its genetic content and other indirect values should be considered. The multiple use system of indigenous forest management in the Southern Cape is discussed in relation to the ecological and sociological demands. The selection system for the production of indigenous timbers, the utilisation of the exotic Acacia melanoxylon from the forest, the picking of Rumohra adiantiformis fronds and the provision of recreation facilities are discussed. Some recommendations are made for improved conservation and utilisation of areas of forest in private ownership. It seems possible to reconcile conservation and utilisation interests if the ecological

requirements and interactions of the forest ecosystem are considered in relation to the effects of the management practices.
CONSERVATION, EXOTIC, FERN, MANAGEMENT, RECREATION, TIMBER, UTILISATION

166
Geldenhuys, C.J. 1983. Distribution and classification of the indigenous evergreen forests. In: Odendaal, P.B. (ed.) **South African Forestry Handbook.** South African Institute of Forestry, Pretoria. p.262-268
The distribution of the South African forests, the factors affecting their distribution and their relationships with similar forests elsewhere are briefly discussed. The broad categories of Afromontane and Indian Ocean coastal belt forests are described in relation to the categories used by Acocks (1975).. The present system of classification used in the management of the Southern Cape forests are finally described.
DISTRIBUTION, ENVIRONMENT, PHYTOGEOGRAPHY, VEGETATION TYPE

167
Geldenhuys, C.J. 1983. (Local volume table for indigenous tree species in the Southern Cape.) Plaaslike volumetabel vir inheemse boomsoorte in die Suid-Kaap. In: Odendaal, P.B. (ed.) **South African Forestry Handbook.** South African Institute of Forestry, Pretoria. p.356-357
A regression equation to determine underbark utilisable volume for timber tree species in the Southern Cape is discussed and a local volume table is presented. See also 457.
BIOMASS, INVENTORY, METHODOLOGY, TIMBER, UTILISATION

168
Geldenhuys, C.J. & Maliepaard, W. 1983 The causes and sizes of canopy gaps in the Southern Cape forests. **South African Forestry Journal 124**:50-55
The Southern Cape indigenous forests are not subject to regular major disturbances. The most frequent cause of canopy gaps is single trees dying standing, with an average gap size of 150 m^2. Windfall gaps are caused by uprooting of smaller trees (210 m^2) and by snapping at the base of larger, partly rotten live trees (330 m^2). Gaps caused by felled trees (450 m^2) are significantly larger than natural gaps. The results indicate that a single tree selection system will most closely resemble the natural disturbance processes. The large gaps, especially after logging disturbance, cause deterioration of the microclimatic and soil conditions. Recommendations are provided to ensure that during logging operations, canopy gap sizes are minimized and suitable site conditions are maintained in gaps to ensure good regeneration of tree species.
DISTURBANCE, MANAGEMENT, MORTALITY, REGENERATION, SUCCESSION, TIMBER, UTILISATION, WINDFALL

169
Geldenhuys, C.J. & Van Laar, A. 1980 Interrelationships between vegetation and site characteristics in the Gouna forest. **South African Forestry Journal 112**:3-9
Sampling studies in the Gouna forest indicated that density of tree regeneration, density and height of Onderbos (Trichocladus crinitus) and basal area/ha of different tree species groups are significantly different for different aspects. The height and density of Onderbos, density of regeneration, basal area of tree species groups, density of individual tree spcies, density of ground flora species, slope, radiation index and canopy height are all interrelated. A table is presented giving the relative frequency, density and density per cent of different tree species.
BIOMASS, DENSITY, DIVERSITY, ENVIRONMENT, INTERACTION, REGENERATION, VEGETATION STRUCTURE

170
Gerhard, G. 1902 **Beitrage zur blattanatomie von gewaschen des Knysna waldes.** Hildesheim.
ENVIRONMENT, MORPHOLOGY

171
Gerstner, J. 1946 Some factors affecting the perpetuation of our indigenous silva. **Journal of the South African Forestry Association 13**:4-11
The paper records certain observations on interaction between plants and animals in forests in Zululand.
FAUNA, INTERACTION

172
Gill, L. 1952 Dusks and dawns in the Knysna forest. **African Wildlife 6**:323-327
A general account of birds and their habits.
BEHAVIOUR, BIRD, HABITAT

173
Gillooly, J.F. 1976 Dendroclimatology in South Africa. **South African Forestry Journal 98**:64-65.
CLIMATE, DENDROCHRONOLOGY

174
Glyphis, J. 1976 A phytosociological survey of the Back Table, Table Mountain. In: Moll, E.J. & Campbell, B.M. (eds.) **Table Mountain, a conservation and management report.** Department of Botany, University of Cape Town, Rondebosch. p.1-25
It includes a description of the Cunonia capensis forest community.
COMMUNITY, FYNBOS, PHYTOSOCIOLOGY

175
Glyphis, J., Milton, S.J. & Siegfried, W.R. 1981 Dispersal of Acacia cyclops by birds. **Oecologia 48**:138-141
BIRD, DISPERSAL, EXOTIC, INTERACTION

176
Glyphis, J., Moll, E.J. & Campbell, B.M. 1978 Phytosociological studies on Table Mountain, South Africa: 1. The Back Table. **Journal of South African Botany 44**:281-289
It includes a description of one forest community: the Ilex-Blechnum Forest.
COMMUNITY, PHYTOSOCIOLOGY, SPECIES LIST

177
Granger, J.E. 1976 **Vegetation changes, some related factors and changes in the water balance following twenty years of fire exclusion in catchment 9, Cathedal Peak Forestry Research Station.** Unpublished PhD thesis, University of Natal. 612 pp.
FIRE, GRASSLAND, HYDROLOGY, MONTANE, VEGETATION CHANGE, WATER RELATIONS

178
Grewar, S.G. 1982 Conservation management of indigenous forests. In: Jordaan, J.V. (Ed.) **Saasveld 50:1932-1982.** Department of Environment Affairs, Pretoria. p.155-161
A brief account is given on the past, present and future indigenous forest management policies and principles for the Southern Cape area.
HISTORY, MANAGEMENT, TIMBER, UTILISATION

179
Grewar, S.G. 1983. Management of indigenous evergreen high forests. In: Odendaal, P.B. (ed.) **South African Forestry Handbook.** South African Institute of Forestry, Pretoria. p.269-278
The policy and principles of management of the Southern Cape forests are discussed. These include diameter distribution, species groups and yield regulation. The management practices of inventory and mapping, harvesting and timber marketing, weed control, enrichment plantings, etc. are briefly described.
FORESTRY, MANAGEMENT, METHODOLOGY, RECREATION, REGENERATION, TIMBER, UTILISATION

180
Grobler, P.J. & Marais, J. 1967 (The vegetation of the National Bontebok Park, Swellendam.) Die plantegroei van die Nasionale Bontebokpark, Swellendam. **Koedoe 10**:132-148
COMMUNITY, FYNBOS, SPECIES LIST

181
Grut, M. 1977 Notes on the history of Forestry in the western Cape, 1652-1872. **South African Forestry Journal 100**:32-37
The demand and supply of wood, the indigenous forests, forest law, and afforestation are dealt with. The scanty indigenous forests were almost from the first European settlement insufficient to meet the demands of the settlement for firewood and building timber. The authorities therefore immediately began trials to

find exotic or indigenous tree species suitable for afforestation.
EXOTIC, FORESTRY, HISTORY, TIMBER, UTILISATION

182
Hall, A.V. 1961 Distribution studies of introduced trees and shrubs in the Cape Peninsula. **Journal of South African Botany 28**:101-110
DISTRIBUTION, EXOTIC

183
Hall, A.V. 1969 Prospects for using botanical fossils as a guide to quaternary environments in the south-west Cape. **South African Archaeological Bulletin 24**:144-148
CLIMATE, FOSSIL, PALAEOECOLOGY

184
Harrison, E.R. 1968 The epiphytic orchids of the St. Lucia Reserve. **Lammergeyer 6**:63-72
Ten species of epiphytic orchids in this area are described in terms of distribution, habitat and inflorescence, and illustrated with a sketch.
EPIPHYTE, HABITAT, IDENTIFICATION AID, SPECIES LIST

185
Harrison, E.R. 1972 **Epiphytic orchids of southern Africa** - a field guide to the indigenous species. Natal Branch of Wildlife Protection and Conservation Society of South Africa, Durban.
This illustrated book provide information on all the known species found in southern Africa south of the Limpopo river. A vegetative key provides for identification into 18 groups. Information includes distribution maps, line drawings, taxonomic description and notes on habitats.
EPIPHYTE, HABITAT, IDENTIFICATION AID, SPECIES LIST

186
Hendey, Q.B. 1975 Fossil occurrences at Langebaanweg, Cape Province. **Nature 244**:13-14
FOSSIL, PALAEOECOLOGY

187
Hendey, Q.B. 1976 The Pliocene fossil occurences in 'E' quarry, Langebaanweg, South Africa. **Annals of the South African Museum 69**:215-247
FOSSIL, PALAEOECOLOGY

188
Hendey, Q.B. 1982 **Langebaanweg - a record of past life.** South African Museum, Cape Town. 71 pp.
The book tells the story of the past 20 million years at Langebaanweg near Saldanha Bay where one of the world's richest fossil sites provides a unique insight into a tropical wildlife paradise in

decline. The sediments of the region and the fossils they contain, testify to periods of warmer temperature, higher rainfall, lush vegetation, and animal life of great abundance and variety. Today the south-western coast of South Africa is dry and windswept, the vegetation stunted, and few wild animals inhabit the region.
CLIMATE, FAUNA, FLORA, FOSSIL, PALAEOECOLOGY, VEGETATION CHANGE

189
Henkel, J.S. 1912 The indigenous high forest situated in the Divisions of George, Knysna and Humansdorp, Cape Province. **South African Journal of Science 9**:68-76
ENVIRONMENT, VEGETATION TYPE

190
Henkel, J.S. 1934 **The woody plants of Natal and Zululand.** Natal University Development Fund Committee, Pietermaritzburg.
IDENTIFICATION AID, SPECIES LIST

191
Henkel, J.S., Ballenden, S. St. C. & Bayer, A.W. 1936 An account of the plant ecology of the Dukuduku Forest Reserve and adjoining areas of the Zululand coast belt. **Annals of the Natal Museum 8**:95-125
A general account is given of the physical and biotic features of the area. The ecology of the various plant communities is discussed. Stream Bank or Swamp forest, Coast forest and Yellow-wood forest are described as well as other vegetation types. Finally afforestation potential is discussed.
COMMUNITY, ENVIRONMENT, FORESTRY, VEGETATION TYPE

192
Hennessy, E.P. 1974 Dune vegetation in Natal. **Veld and Flora 4**:47-49
COMMUNITY, DUNE, VEGETATION TYPE

193
Henrici, M. 1943 Transpiration of grasses in the Sour Mountain Grassveld of the Drakensberg in comparison with the water loss of indigenous forests. **South African Journal of Science 39**:155-163
Daily water output of grasses was much higher than the indigenous forest trees. Furthermore, the indigenous trees with a few exceptions, e.g. Leucosidea, Calpurnia, Rhus and Buddleja have distinctly small values for the dry season, although even then the soil is still wet in the forest, whilst the grasses even in a very dry soil may show some very large values. An area under grass were calculated to transpire much more than a similar area under sclerophyllous trees.
GRASSLAND, HYDROLOGY, TRANSPIRATION, WATER RELATIONS

194
Heydorn, A.F.P.J. 1975 Plant succession on the sea dunes of

Betty's Bay. **Veld and Flora 61**:26-29
DUNE, SUCCESSION

195
Heydorn, A.E.F. & Tinley, K.C. 1980 **Synopsis of the Cape Coast: Natural features, dynamics and utilisation. Part I. Estuaries of the Cape Series.** CSIR Research Report 380. 96 pp.
DUNE, ENVIRONMENT, RECREATION, UTILISATION

196
Heyns, A.J. 1957 (Flora, phenology and regeneration of an indigenous forest community near Stellenbosch.) Flora, fenologie en regenerasie van 'n inheemse woudgemeenskap naby Stellenbosch. **Journal of South African Botany 23**:111-119
In the Western Cape Province forest communities, mostly small, occur in mountain ravines, along rivers and on talus along the mountain sides. The origin of these forest communities is obscure and three possible origins are mentioned. The article embodies results of the study of one such community, 0,6 ha in extent, partly in a ravine and partly on talus, near Stellenbosch. The community consists mainly of an eastern element, i.e. of species occurring in the Eastern Cape Province, and of a southern or western element, i.e. species which do not occur in the Eastern Cape Province. The characteristic fynbos plants of the Cape flora do not occur in the community. There are slight indications that the community previously occupied a larger area and that at present it maintains itself and is increasing its area.
COMMUNITY, FLORA, KLOOF, PHENOLOGY, PHYTOGEOGRAPHY, REGENERATON, VEGETATION CHANGE

197
Hitchens, P.M. 1968 Records of plants eaten by mammals in the Hluhluwe Game Reserve, Zululand. **Lammergeyer 8**:31-39
The paper lists the food plants in tabular form, including forest species, of a range of mammals.
HERBIVORY, INTERACTION, MAMMAL, UTILISATION

198
Horsham, R.J.E. 1950 Notes on the Boomslang. **African Wildlife 4**:237-242
DISTRIBUTION, HABITAT, REPTILE

199
Hughes, D.A. & Gorgens, A.H.M. 1981 **Hydrologocial investigations in the Southern Cape Coastal Lakes Region.** Report 1/81, Hydrological Research Unit, Rhodes University, Grahmastown. 76 pp.
The hydrological characteristics of an area of 2 200 km^2 is outlined. The area is bounded to the north by the Outeniqua Mountains, the Indian Ocean to the south, and to the east and west by the catchments of the Knysna and Maalgate Rivers respectively. The information contained on geology, topography and drainage, climate, soils,

vegetation (including the forests) and land use are essential background to the detailed hydrograph simulation studies being undertaken.
ENVIRONMENT, HYDROLOGY, LAND USE, SOIL

200
Huntley, B.J. 1965 A preliminary account of the Ngoye Forest Reserve, Zululand. **Journal of South African Botany 31**:177-205
The history, position, and environmental factors of Ngoye Forest are described and its future discussed. The main plant communities and their interrelationships are dealt with, special reference being made to the tropical affinities of both flora and fauna. A simple management programme is recommended whereby the reserve would be conserved as a Scientific Research Area.
COMMUNITY, CONSERVATION, DISTURBANCE, ENVIRONMENT, HISTORY, MANAGEMENT, SPECIES LIST

201
Huntley, B.J. 1978 Ecosystem conservation in southern Africa. In Werger, M.J.A. (ed.) **Biogeography and ecology of Southern Africa.** W. Junk, The Hague. p.1333-1384
CONSERVATION, VEGETATION TYPE

202
Hutchins, D.E. 1889 National Forests. **Agricultural Journal of the Cape of Good Hope 13**:528-541
CONSERVATION, DISTRIBUTION

203
Hutchins, D.E. 1892 The forests of Natal. **Indian Forester 18**:204-205 & 245-253
DISTRIBUTION, VEGETATION TYPE

204
Hutchins, D.E. 1900 Cape National forests. **Transactions of the South African Philosophical Society 11**:53-66
DISTRIBUTION, VEGETATION TYPE

205
Hutchins, D.E. 1903 Some aspects of South African forestry. **Report to the South African Association for the Advancement of Science 1**:354-361
CONSERVATION, FORESTRY

206
Hutchins, D.E. 1905 The indigenous forests of South Africa. **Report to the South African Association for the Advancement of Science 3**:319-334
DISTRIBUTION, VEGETATION TYPE

207
Immelman, W.F.E., Wicht, C.L. & Ackerman, D.P. 1973 **Our Green**

Heritage. Tafelberg, Cape Town. 332 pp.
EXOTIC, IDENTIFICATION AID, PROPAGATION, UTILISATION

208
Jacobsen, N.H.G. 1978 An investigation into the ecology and productivity of epiphytic mosses. **Journal of South African Botany 44**:297-312
A description of forest, thicket and riverine vegetation is included.
EPIPHYTE, GROWTH, HABITAT, MOSS

209
Jacobsen, W.B.G. 1983 **The ferns and fern allies of southern Africa.** Butterworths, Durban. 542 pp.
Illustrated with photographs and distribution maps.
DISTRIBUTION, FERN, HABITAT, IDENTIFICATION AID, SPECIES LIST, TAXONOMY

210
Jacot-Guillarmod, A. 1974 Vegetation of the Grahamstown area. In: J.B. McI Daniel (ed.) **Grahamstown and its environs.** Institute of Social and Economic Research, Rhodes University, Grahamstown. p.16-19
A short description is given of the Temperate forest.
FYNBOS, VEGETATION TYPE

211
Jarvis, M.J.F., Currie, M.H. & Palmer, N.G. 1980 Food of Crowned eagles in the Cape Province, South Africa. **Ostrich 51**:215-218
Bones were collected from 16 nests, all but one in patches of indigenous forest, of Crowned eagles Polemaetus coronatus. Three of the nests were observed from hides. The bone remains give some idea of the spectrum of prey animals taken and reveal differences from nest to nest. A total of 598 distinct prey animals were identified. The rock hyrax formed 42%, vervet monkey 8% and juvenile bovids 6%. Although 15 of the 16 nests contained rock hyrax remains, blueduiker were found at only 10 and bushbuck at 9 nests. Juvenile bovids were mainly domestic lambs and came from 10 nests, but never comprised more than 16% of the total prey animals at any one nest.
BEHAVIOUR, BIRD, CONSERVATION, INTERACTION, MAMMAL

212
Jessop, J.P. & Jacot-Guillarmod, A. 1969 The vegetation of the Thomas Bain Nature Reserve. **Journal of South African Botany 35**:367-392
COMMUNITY, SPECIES LIST

213
Joubert, J.G.V. 1969 **The nutritive value of natural pastures in the districts of Calitzdorp, George, Knysna, Mossel Bay, Oudtshoorn and Uniondale in the Winter Rainfall Area of the**

Republic of South Africa. Technical Communication 82, Department of Agricultural Technical Services, Pretoria.
It includes the Knysna Forest, Valley Bushveld (Gouritz River Scrub) and Coastal Dunes.
DUNE, HERBIVORY, NUTRIENT, UTILISATION, VEGETATION TYPE

214
Keay, R.W.J. 1959 **Vegetation Map of Africa south of the Tropic of Cancer.** Oxford University Press, London.
MAP, VEGETATION TYPE

215
Keet, J.D.M. 1961 Stinkwood stories. **Journal of the South African Forestry Association 38**:34-35
A few stories relate to the propagation of this species.
PROPAGATION

216
Keet, J.D.M. 1962 The Trema plantations of Westfalia Estate. **South African Forestry Journal 41**:15-26
Trema orientalis extends from Transvaal through Natal to the Eastern Cape. The species reaches large dimensions with long, clear boles in the mountain forests. Outside the forest belts or kloofs extending from them, the tree takes the form and size of an ornamental with low-set wide crowns. Afforestation with this relatively fast-growing pioneer was begun at Westfalia in 1945 and discontinued in 1950. Westfalia is situated below the mist Belt at an altitude between 730 m and 990 m. The results prove that on poor sites no indigenous forest tree in pure, even-aged crops can be used for amelioration of the conditions. Volume production on the best sites were, however, promising. Aspect was of minor importance where factors such as soil fertility, depth and moisture were favourable. Excessive moisture, above all stagnant water, is detrimental to Trema. Damage by forest game led to complete loss in some places. An invasion by caterpillars of a Chrysomelid beetle proved to be cyclic. The general utility timber is reasonably durable and immune to insects.
ENVIRONMENT, GROWTH, HERBIVORY, INVERTEBRATE, PROPAGATION, TIMBER, UTILISATION

217
Kerfoot, O. 1963 The root systems of tropical forest trees. **Commonwealth Forestry Review 42**:19-26
MORPHOLOGY, ROOTS

218
Killick, D.J.B. 1958 An account of the plant ecology of the Table Mountain area of Pietermaritzburg, Natal. **Memoirs of the Botanical Survey of South Africa 32**:1-133
COMMUNITY, FLORA, SPECIES LIST, VEGETATION TYPE

219
Killick, D.J.B. 1963 An account of the plant ecology of the Cathedral Peak Area of the Natal Drakensberg. **Memoirs of the Botanical Survey of South Africa 34**:1-178
COMMUNITY, FLORA, MONTANE, SPECIES LIST, VEGETATION TYPE

220
King, N.L. 1938 Historical sketch of the development of forestry in South Afica. **Journal of the South African Forestry Association 1**:4-16
The destruction of natural forests in the Southern Cape, Eastern Cape, Transkei, Natal and Orange Free State, and the establishment of plantations of exotics to supply in the timber needs and to conserve the remaining natural forests are discussed.
CONSERVATION, EXOTIC, FORESTRY, HISTORY, MANAGEMENT, TIMBER

221
King, N.L. 1939 The Knysna forests and the woodcutter problem. **Journal of the South African Forestry Association 3**:6-15
The extent of exploitation of the forests by the woodcutters and the measures taken and possibilities for forest recovery are discussed.
CONSERVATION, HISTORY, REGENERATION, TIMBER, UTILISATION

222
King, N.L. 1939 Plant succession on the Transkeian coast. **Journal of the South African Forestry Association 3**:113
A photograph shows clumps of Phoenix reclinata near Qolora on the Kentani Coast, Transkei, which originated on termite mounds. As the palms develop, conditions favourable to the establishment of broad-leaved species are created, which eventually oust the palms.
DUNE, INTERACTION, INVERTEBRATE, SUCCESSION

223
King, N.L. 1940 The Manubi forest. **Journal of the South African Forestry Association 4**:24-29
This forest (700 ha) is situated between the Qora and Ngqwara rivers in the Kentani district, Transkei, at a distance of about 5 km from the coast. The forest is of much better quality than any other in the whole of the Transkeian coastal belt except perhaps part of Mpame in the Elliotdale district and Ntsubane in Eastern Pondoland. This high quality is due to exceptionally good soil conditions coupled with an adequate and fairly well distributed rainfall. Two-thirds of the forest is situated on very rich doleritic soil. The remainder is on soil derived from Beaufort shales with forest of relatively inferior quality. At Manubi, on average, no month has less than 50 mm of rain, while 40% of the annual precipitation of 1 220 mm, occurs in the so-called dry season from April to September. Further, the effective amount of the rainfall is high on account of the gentle slope on which the greater part of the forest is situated. It is close to the sea and 90-180 m a.s.l. Yet it contains several outliers of

sub-tropical flora. The more important trees include Podocarpus falcatus, P. latifolius, Olea capensis, Strychnos decussata, Strychnos mitis, Apodytes dimidiata, Calodendrum capense and Buxus macowani. The protecion, destruction and management potential of the forest are discussed in conclusion.
CLIMATE, COMMUNITY, CONSERVATION, ENVIRONMENT, MANAGEMENT, PHYTOGEOGRAPHY, SOIL, UTILISATION

224
King, N.L. 1941 The exploitation of the indigenous forests of South Africa. **Journal of the South African Forestry Association 6**:26-48
The distribution, exploitation and destruction of the forests in the various parts of the country, including Transkei, are discussed.
CONSERVATION, DISTRIBUTION, UTILISATION, VEGETATION CHANGE

225
King, N.L. 1964 Trees, shrubs and climbers in Kloof-Hill Crest area. **Journal of South African Forestry Association 50**:5-21
A general account of the plants grown by amateur gardeners, and of natural forest, a total of 151 indigenous trees. A description of the soil and climatic conditions is provided. Figures indicate the height growth of certain species.
ENVIRONMENT, GROWTH, IDENTIFICATION AID, PROPAGATION

226
Knoblauch, E. 1896 **Oekologische anatomie der holzpflanzen der Sudafrikanischen immergroen bushregion.** Tubingen.
MORPHOLOGY

227
Knight, R.S. 1983 **The evolution and biogeography of seed dispersal in southern African trees.** MSc thesis, University of Cape Town, Rondebosch.
BIRD, DISPERSAL, EVOLUTION, FRUIT, INTERACTION, PHYTOGEOGRAPHY, REPRODUCTIVE BIOLOGY

228
Knight, R.S. 1984 Patterns of seed dispersal in southern African trees. **Journal of Biogeography 11**:501-514
Comparisons are made between the geographical distributions of southern African tree species possessing drupe, berry, pod, capsule, or nut fruit forms. For those species for which information exists comparisons are also made between wind, avian, and mammalian dispersal agents irrespective of fruit type. For most fruit types, regions of similar species composition orientate in accord with both latitudinal and longitudinal belts, whereas patterns of proportional species richness (the percentage of specified fruit type in the total tree flora) tend to form longitudinal belts. The pod-bearing species occur most commonly in tropical xeric areas. Drupe-bearing species are most numerous in tropical areas, and become more numerous than berry-bearing species in

xeric areas. Since bird-dispersed species usually possess berry fruits, the distribution of the two groups conform with one another. The nut-bearing species are most numerous in temperate areas and are usually associated with wind-dispersal. These results are also interpreted in relation to opportunist (r-selected) and specialist (K-selected) reproductive strategies.
BIRD, DISPERSAL, FRUIT, REPRODUCTIVE BIOLOGY

229
Knight, R.S., Crowe, T.M. & Siegfried, W.R. 1982 Distribution and species richness of trees in South Africa. **Journal of South African Botany 48**:455-480
A phytochorology for southern Africa is derived, based exclusively on species of trees. Cluster analysis, multi-dimensional scaling and information statistic tests are applied to isolate and characterize assemblages of tree species. Six major tree provinces, three of which contain a number of subprovinces, are recognized in a two-tier classification scheme. This phytochorology is compared with classification schemes based on subjective decisions and qualitative information. Correlation and regression analyses involving a suite of environmental variables are used in examining hypotheses concerning an increase in species richness with a decrease in geographical latitude, and a decrease in species richness with an increase in aridity.
DISTRIBUTION, DIVERSITY, ENVIRONMENT, METHODOLOGY, PHYTOGEOGRAPHY

230
Knight, R.S. & Siegfried, W.R. 1982 Distribution and evolution of aril-bearing trees in southern Africa. **South African Journal of Botany 1**:117-123
The spatial distribution of the indigenous southern African aril-bearing tree flora (70 species) is analysed, to determine patterns of species similarity and environmental dependence. Six geographical regions are identified, but differences in species composition between the regions are relatively small. There is no evidence for an east-west dichotomy in the species composition of the flora, concomitant with a rainfall gradient. Proportional species richness (the percentage of aril-bearing species in the total indigenous flora), however, is highest in the dry western sectors of the sub-continent. Correlations with rainfall, temperature, solar radiation, altitude and water-surplus, suggest that the aril-bearing species are environmentally tolerant and are capable of occupying expansive geographical ranges. Fruiting periods tend to be short in individual species, but fruit is available throughout the year in four regions. These results are discussed in relation to hypotheses for the evolution of the aril-bearing flora.
DISPERSAL, DISTRIBUTION, DIVERSITY, EVOLUTION, FRUIT, INTERACTION, PHYTOGEOGRAPHY, REPRODUCTIVE BIOLOGY

231
Knight, R.S. & Siegfried, W.R. 1983 Inter-relationships between type, size and colour of fruits and dispersal in southern African trees. **Oecologia (Berl.) 56**:405-412
The indigenous angiosperm tree flora (1 340 species) of southern Africa was analysed for type, size and colour of fruits and class of biotic dispersal agent (consumer). Species producing fleshy (drupes and berries) and dry (pods, capsules and nuts) fruits account for 52% and 47% respectively, of the flora. The flora contains about 2,5 times as many berry-producing as drupe-producing species. Based on a log-linear model, fruit type, consumer and fruit size are dependent, statistically, on each other, whereas fruit colour depends on both fruit size and consumer type acting independently of each other. Drupes and berries are consumed by birds and mammals, with berries being favoured by both birds and mammals. At least 23% (307 species) of the flora apparently depends predominantly on birds for seed dispersal. Drupes and berries favoured by birds tend to be small and brightly coloured (red or black), whereas those eaten mainly by mammals tend to be large and dull (yellow or green). Relatively few fleshy fruits are brown. Pods, capsules and nuts tend to be brown or green. Birds apparently tend to avoid eating green fruits. The notion that green coloration has evolved to enhance crypsis and/or to signal unpalatability in unripe fruit to reduce premature exploitation is questioned. Green as a cryptic colour is incompatible with the demonstrated mammalian selection of this colour, while to function aposematically a stronger contrast colour may be required.
BIRD, DISPERSAL, FRUIT, INTERACTION, REPRODUCTIVE BIOLOGY

232
Koen, J.H. 1983 Seed dispersal by the Knysna elephants. **South African Forestry Journal 124**:56-58
Elephant faeces from the Knysna Forest were sown in nursery boxes on a monthly basis for a full year. Even after allowing sufficient time for the possible prolonged germination time of some tree species it was found that the Knysna elephants, in contrast to elephants elsewhere in Africa, do not play an important role in seed dispersal of the forest vegetation.
DISPERSAL, FRUIT, INTERACTION, MAMMAL, REPRODUCTIVE BIOLOGY

233
Kotze, J.J. 1943 Nomenclature of the South African yellowwoods. **Journal of the South African Forestry Association 10**:23-25
An introduction with notes on the distribution of the species are given.
DISTRIBUTION, IDENTIFICATION AID, TAXONOMY

234
Kotze, J.J. & Phillips, E.P. 1919 A note on the genus Faurea Harv.

South African Journal of Science 16:232-238 (and correction attached thereto, June 1920)
The distribution of the different species of the genus in South Africa is given. Some notes on the Lilly Vlei population in the Gouna Forest, Knysna, are given.
AUTECOLOGY, DISTRIBUTION, IDENTIFICATION AID

235
Laughton, E.M. 1964 Occurrence of fungal hyphae in young roots of South African indigenous plants. **Botanical Gazette 125**:38-40
The anatomy of young roots in a fresh condition was examined in several indigenous trees, shrubs and herbs of South Africa. With only one exception, all species revealed the presence of hyaline, septate, branched hyphae, varying in quantity and extent of cortical tissue occupied according to the different host species. No hyphae could be identified as belonging to a definite species of fungus, since no isolations or cultures could be attempted. It is possible to consider all these associations between fungal hyphae and the cells of plant roots as examples of "endotrophic mycorrhizae". In Erica perspicua the development of branching hyphae outside the epidermis of the young root was evident, but slight. The studies were morphological only. Tree species investigated were: Gonioma kamassi, Curtisia dentata, Cunonia capensis, Platylophus trifoliatus, Apodytes dimidiata, Ocotea bullata, Ekebergia capensis, Ptaeroxylon obliquum, Rapanea melanophloeos, Ochna arborea, Olea capensis subsp. macrocarpa, Faurea macnaughtonii, Podocarpus falcatus, P. latifolius and P. henkelii and several Transvaal species.
FUNGI, INTERACTION, MORPHOLOGY, ROOTS

236
Laughton, F.S. 1938 **The sylviculture of the indigenous forests of the Union of South Africa with special reference to the forests of the Knysna Region.** Science Bulletin 157, Forestry Series 7, Government Printer, Pretoria. 168 pp.
The first section deals with the distribution and history of exploitation of forests in different parts of the country. The second sections deals with the management of the Knysna forest. The climatic and edaphic factors of the environment are described. The composition of the forest types are discussed in relation to canopy and understorey trees, size class distribution, growth rate, succession following exploitation, etc. This forms the basis of the proposed selection system of timber utilisation, regeneration, nursery techniques, etc.
CLIMATE, DEMOGRAPHY, DISTRIBUTION, ENVIRONMENT, FLORA, FORESTRY, GROWTH, HISTORY, INTERACTION, MANAGEMENT, PHYTOGEOGRAPHY, PROPAGATION, REGENERATION, SUCCESSION, UTILISATION, VEGETATION STRUCTURE, VEGETATION TYPE, WATER RELATIONS

237
Laughton, F.S. 1938 The raising of transplants of indigenous

tree species for open-rooted planting. **Journal of the South African Forestry Association 1**:17-27

A technique which has proved successful for raising transplants of indigenous species for open-rooted planting at Diepwalle is outlined. The following species are dealt with: Podocarpus latifolius, P .falcatus, P. henkelii, Ocotea bullata, Olea capensis subsp. macrocarpa, Curtisia dentata, Gonioma kamassi, Cunonia capensis, Faurea macnaughtonii, Rapanea melanophloeos and Ekebergia capensis. Brief notes on the time of seeding, the collection and treatment of seed, and the choice and preparation of nursery beds are also included. The importance of producing superficially rooted plants, in order to facilitate transplanting, is stressed and the use of shallow beds over clayey subsoils, repeated transplanting, and bending up of the roots at time of transplanting are suggested as effective measures for attaining this object.
PHENOLOGY, PROPAGATION, REGENERATION

238
Laughton, F.S. 1942 Notes on the sylviculture of the indigenous forests. **Journal of the South African Forestry Association 8**:24-36

The paper describes the various types and indicates the most important factors to be borne in mind in determining the objectives of forest management. As a result of 20 years of intensive research into the factors governing the regeneration of the indigenous forests, a classification is attempted of the types of locality in which the forests are usually found. Emphasis is laid on soil-moisture and soil aeration. On this basis an attempt is made to decide the general principles on which the management of the forests should be based.
COMMUNITY, MANAGEMENT, REGENERATION, SOIL, VEGETATION TYPE

239
Lawrence, R.F. 1953 **The biology of the cryptic fauna of forests.** A.A. Balkema, Cape Town. 408 pp.

This is an account of the humus layer of the forest floor as an ecological entity. The composition of the fauna inhabiting it is described and compared with other biological communities. The biological characteristics of the inhabitants of this community are analysed. In conclusion the distinctive characteristics of this fauna are enumerated. The role and properties of the humus layer are discussed. The importance of humus in transforming a shallow, infertile and inhospitable soil into a productive one on which forest trees and seedlings can flourish is stressed.
FAUNA, INTERACTION, INVERTEBRATE, LITTER, SOIL

240
Lawrence, R.F. 1964 The fauna of the forest soil. In: Davis, D.H.S. (Ed.). **Ecological studies in southern Africa.** W. Junk, The Hague. p.126-136

The cryptozoa are of immense interest and significance from evolutionary and ecological point of view. In the South African

forests they are represented by an exceptionally varied and abundant fauna. Their way of life is intimately bound up with the forest and they can live nowhere else. More and more it becomes apparent that, as the oldest indigenous South African animals, they can contribute to understanding the problems of zoogeography and of continental drift.
FAUNA, INTERACTION, INVERTEBRATE, LITTER, PALAEOECOLOGY, SOIL

241
Lawrence, R.F. 1981 **Centipedes and millipedes of southern Africa.** A.A. Balkema, Cape Town.
These animals are closely associated with the temperate rainforest. They are "indicators" of unspoilt forest. The relationship between these animals and the forest are discussed.
HABITAT, INTERACTION, INVERTEBRATE

242
Leistner, O.A. 1966 Podocarpaceae **Flora of southern Africa 1**:34-41
A short description, taxonomy and distribution of the four south African species of Podocarpus.
DISTRIBUTION, HABITAT, IDENTIFICATION AID, PHYTOGEOGRAPHY, TAXONOMY

243
Le Roux, P.J. 1981 Supply of fuel-wood for rural populations in South Africa. **South African Forestry Journal 117**:22-27
The paper is mainly concerned with woodlots and plantations. It contains, however, a historical review. Concern was expressed about the overexploitation of forest resources in the Cape as early as the 17th century and the earliest proclamation to protect them was in 1683. The paper gives the number of fuelwood users in different rainfall zones, and concludes that 6,6 million people are dependent on indigenous forest or exotic plantations for their fuelwood requirements.
CONSERVATION, EXOTIC, HISTORY, UTILISATION

244
Levyns, M.R. 1938 Some evidence bearing on the past history of the Cape Flora. **Transactions of the Royal Society of South Africa 26**:401-424
EVOLUTION, FYNBOS, ORIGIN, PALAEOECOLOGY, PHYTOGEOGRAPHY

245
Levyns, M.R. 1964 Migrations and origin of the Cape Flora. **Transactions of the Royal Society of South Africa 37**:85-107
The Cape Flora (Fynbos) is separated from the Succulent Karroo and Temperate Forest floras of the Cape by its water requirements. The Cape Flora tolerates moderate summer drought; the Succulent Karroo flora occurs in areas with erratic rainfall not exceeding 250 mm p.a., and the Forest flora occurs only in mesic kloofs and regions with a high rainfall evenly distributed through the year. All three floras are frost sensitive. The Temperate

forest flora is probably of mixed origin as it includes both austral (eg Podocarpus, Meterosideros, Cunoniaceae, Proteaceae) and boreal elements (eg Olea, Celtis, Ilex). Relative to the genera of the Cape Flora, the Forest genera are small, and it is possibly that Forest vegeation is retreating as aridity in southern Africa increases. Further evidence for the shrinking range of Temperate forest in the Cape is the decline in species richness from east to west across the Province, the presence of outlyers in arid areas, and fossil Podocarpus wood buried on the now arid Cape Flats.
CLIMATE, ENVIRONMENT, FLORA, FOSSIL, FYNBOS, ORIGIN, PHYTOGEOGRAPHY, VEGETATION CHANGE, WATER RELATIONS

246
Lilly, M.A. 1977 **An assessment of the dendrochronological potential of indigenous tree species in South Africa.** Environmental Studies Occasional Paper 18, Department of Geography and Environmental Studies, University of Witwatersrand, Johannesburg.
This paper is subdivided into three sections: Methods of dendrochronology; Dendrochronology in South Africa; Growth rings in South African trees: their dendrochronological suitability. The results from a study of 108 tree species are reported. It is apparent that indigenous tree species in South Africa are by no means well-suited for dendrochronological studies. Based on the occurrence or absence of seven positive, one neutral and seven negative criteria it was proved possible to determine semi-quantitative dendrochronological ratings for trees. A first category has been isolated as those showing the highest potential for dendrochronological work. All these trees have ring margins demarcated by fine parenchyma layers. These are: Albizia forbesii, Burkea africana, Ekebergia capensis, Zanthoxylum davyi and Vepris lanceolata. In addition a second category of tree types consisting of the various species of Podocarpus and Widdringtonia as well as Rhus pyroides, Clutia abyssinica and Celtis africana may possibly be useful in tree ring work. Wood density and the distribution of the species are two further problematical factors to be considered. The only species that meets these criteria is Ekebergia capensis. In forest, where most of the potentially useful species occur, climatic effects on tree rings may be masked by other factors affecting growth. The need for application of the principle of replication and careful correlation studies are suggested.
DENDROCHRONOLOGY, GROWTH, METHODOLOGY

247
Lister, J.S. 1902 **Report on forestry in Natal and Zululand.** Times Printing and Publishing Co., Pietermaritzburg.
The report gives descriptions of the Zululand indigenous forests of Qudeni, Nkandla, Ngoye and Ngomi with recommendations for their management and protection, and for the establishment of plantations.
CONSERVATION, EXOTIC, FORESTRY, HISTORY, MANAGEMENT, VEGETATION TYPE

248
Liversidge, R. 1959 Tropical mountain birds south of the Zambesi. **Ostrich Supplement 3**:68-786
BIRD, DISTRIBUTION, MONTANE

249
Loock, E.E.M. 1951 A key to the trees and woody shrubs of the forests of the Knysna Region. **Journal of the South African Forestry Association 20**:81-105
The key provides comparatively simple means of identifying 73 indigenous trees and shrubs of the Knysna region from their leaves, twigs and bark. A glossary of terms is included and information regarding common names, size and common localities and descriptions of leaves and bark are assembled in a schedule.
IDENTIFICATION AID, SPECIES LIST

250
MacDonald, I.A.W. & Birkenstock, P. 1980 Birds of the Hluhluwe-Umfolozi game reserve complex. **Lammergeyer 29**:1-56
The available information on the distribution and status of the birds in this area is summarized. Subjective assessments are made of habitat requirements, relative abundance and conservation status, including many birds from forest.
BIRD, CONSERVATION, DISTRIBUTION, HABITAT

251
MacMahon, R.P. 1978 **Some aspects of the behaviour of Samango Monkeys (Cercopithecus albogularis labiatus)**. Unpublished MSc thesis, University of Natal, Pietermaritzburg.
BEHAVIOUR, MAMMAL

252
Marloth, R. 1908 **Das Kapland, insonderheit das Reich der Kapflora, das Waldgebiet und die Karroo.** Gustav Fisher Verlag, Jena. 435 pp.
The section on the forests of the South Coast includes the Knysna Forests, the forest patches of Swellendam, the ravine forests of Table Mountain, the original extent of the forest stands, the forest stands of the Eastern Cape Colony, and the Knysna Forests of A.F.W. Schimper.
DISTRIBUTION, HISTORY, VEGETATION TYPE

253
Martin, A.R.H. 1960 The ecology of Groenvlei, a South African fen. 1: The primary communities. **Journal of Ecology 48**:55-71
The dense vegetation described includes woodland (scrub forest).
COMMUNITY, DUNE

254
Martin, A.R.H. 1965 Plant ecology of the Grahamstown Nature

Reserve. 1: Primary communities and plant succession. **Journal of South African Botany 31**:1-54
It includes scrub and forest communities.
COMMUNITY, SUCCESSION, VEGETATION TYPE

255
Martin, A.R.H. 1966 Plant ecology of the Grahamstown Nature Reserve. 2: Some effects of burning. **Journal of South African Botany 32**:1-39
In a short section the disastrous fire of August 1955, one of the most severe ever known in Grahamstown district, is described. The whole of the heath and grassland of the Nature Reserve, and extensive woodlands of eucalypts, pine and wattles were burned. However, the natural forest and scrub, as in previous fires, escaped with marginal injury. In one or two places, roots ignited and smouldered for several days, spreading some distance into the forest with some consequent burning of litter, but no single area of natural forest was destroyed or even seriously burnt back, since the main components of the forest margin (Rapanea melanophloeos, Tarchonanthus camphoratus) regenerate well by epicormic shoots.
DISTURBANCE, EXOTIC, FIRE, REGENERATION

256
Martin, A.R.H. 1968 Pollen analysis of Goenvlei lake sediments, Knysna (South Africa). **Review of Palaeobotany and Palynology 7**:107-144
Two Groenvlei pollen diagrams are considered to cover a period of ca. 8 000 years. The site is coastal and interpretation is complicated by pollen-taxonomic problems, marine transgression and presumed movements of large areas of coastal dunes. Attempts are made to allow for these factors in reaching some conclusions about former vegetation and climate. It is thought that during the earliest period recorded, forest was much restricted, a dry steppe-like heath occupied most of the area and the 400 mm isohyet occurred some 100 km east of its present position. An amelioration of climate seems to have taken place ca. 7 000 years ago but its exact nature and duration is obscured by physiographical changes. At a time corresponding fairly closely to the onset of the subatlantic period in Europe, a further amelioration occurred with considerable spread of forest elements onto the dunes themselves. There is evidence of a slight subsequent regression, antedating European entry into the area. European influence is seen in a sample from the top of the main profile.
CLIMATE, PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

257
Martin, A.R.H. & Noel, A.R.A. 1960 **The flora of Albany and Bathurst.** Rhodes University, Grahamstown. 125 pp.
The section on the Temperate Evergreen Forest Formation distinguishes between Temperate Rainforest (transition scrub) and Warm Temperate Forest (scrub, coastal woodland, and coastal river-fringing scrub).
FLORA, SPECIES LIST, VEGETATION TYPE

258
Marwick, C.W. 1973 **Kwamahlati, the story of forestry in Zululand.** Bulletin 49, Department of Forestry, Pretoria. 72 pp.
The exploitation and destruction agents of the following forests are discussed: Ngoye, Ngome, Qudeni, Nkandla, Dukuduku, Tongaland forests and coastal forests.
FORESTRY, HISTORY, UTILISATION, VEGETATION TYPE

259
McDowell, C.R. & Moll, E.J. 1981 Studies of seed germination and seedling competition in Virgilia oroboides (Berg.) Salter, Albizia lophantha (Willd.) Benth. and Acacia longifolia (Andr.) Willd. **Journal of South African Botany 47**:653-685
A pilot ecological study comparing the indigenous legume tree Virgilia oroboides with two ecologically similar aliens, Albizia lophantha and Acacia longifolia was initiated. Similarities were found in seed germination biology, with all three species showing rapid germination once seed dormancy is broken. Differential inhibition of seed germination with leaf litter and interspecific seed-mix treatments was investigated and showed increasing sensitivity in the order Virgilia, Albizia, Acacia. A semi-natural replacement series interspecific seedling competition experiment revealed that all three species occupy similar niches. The order of aggressiveness was found to be Virgilia, Albizia then Acacia, the interaction effects being most clearly observed in the root biomass. Species seed-mass and energy content were compared. Shoot and root increments relative to final shoot and root biomasses were examined in addition to the performance of each species in nutrient and non-nutrient media. The success of a particular species in a given combination of species depends on a large number of factors, e.g. varying nutrient and moisture availabilities of different soils, as well as differential predation on species. It is suggested that if the environment is manipulated correctly Virgilia (or other suitable indigenous species) could possibly be used as a subsidiary control measure against the invasive aliens Albizia and Acacia.
EXOTIC, GROWTH, INTERACTION, LITTER, REPRODUCTIVE BIOLOGY

260 McKenzie, B. 1978 **A quantitative and qualitative study of the indigenous forests of the south-western Cape.** Unpublished MSc thesis, University of Cape Town, Rondebosch. 151 pp.
The forests in the southwestern Cape occur as small or large patches in seven complexes on the foothills, slopes, kloofs and streams of the major mountain ranges. They occur on granite, shale and sandstone in regions where the annual precipitation exceeds 650 mm and the site is fairly well protected. A drop in species numbers is evident from east to west. Its Afromontane affinity is discussed. The effects of geology, climate, fire and exploitation on the forests are discussed. The phytosociological data was analysed by the Braun-Blanquet table method and an Ordination method and the results compared. The importance of

the various tree and shrub species in the various canopy layers, forest complexes and sites are discussed.
COMMUNITY, DISTRIBUTION, ENVIRONMENT, METHODOLOGY, PHYTOSOCIOLOGY, SPECIES LIST

261
McKenzie, B., Moll, E.J. & Campbell, B.M. 1976 A suggested management plan for the indigenous vegetation of Orange Kloof, Table Mountain, based on a phytosociological survey. **South African Forestry Journal 99**:1-6
Orange Kloof is an unique area of the Table Mountain Reserve as a large section of it has been protected from fire for more than thirty years, and because it supports some of the largest relic patches of indigenous forest on the Cape Peninsula. The management strategy and conservation of this area is, therefore, extremely important. This forest is situated in the winter rainfall region with hot, dry summers and cool, wet winters with 1 227 mm annual rainfall. Additional moisture is received from frequent mists in this region. This study revealed the possible dynamics of the vegetation units as well as management priorities. The major scrub communities recognized showed greater affinity to the forests than to the fynbos. This indicated that, providing the scrub communities are left undisturbed, they would eventually develop into forest.
COMMUNITY, ENVIRONMENT, FIRE, KLOOF, MANAGEMENT, SUCCESSION

262
McKenzie, B., Moll, E.J. & Campbell, B.M. 1977 A phytosociological study of Orange Kloof, Table Mountain, South Africa. **Vegetatio 34**:41-53
A description is given of several forest and scrub communities and their relationships.
COMMUNITY, PHYTOSOCIOLOGY, SPECIES LIST

263
McNaughton, J. 1977 Dendrochronology work by the Climatology Research Group at the University of the Witwatersrand. **Trees in South Africa 29**:70-71.
The paper discusses the agreement of results from tree ring analyses of two cross-sections of Podocarpus falcatus collected at Woodbush (Transvaal) and Karkloof (Natal).
CLIMATE, DENDROCHRONOLOGY, METHODOLOGY

264
McNaughton, J. & Tyson, P.D. 1979 A preliminary assessment of Podocarpus falcatus in dendrochronological and dendroclimatological studies. **South African Forestry Journal 111**:19-33
Little dendrochronological and dendroclimatological research has been carried out in southern Africa to date, although it has been established that Podocarpus falcatus is suitable for this work. This paper discusses the climatological background

of the sampling area, Witelsbos forest, Southern Cape, and gives details on data and methodology. Despite great variation between specimens, some common characteristics of growth are apparent, and probable periods of growth suppression and enhancement can be detected as far back as 1770.
CLIMATE, DENDROCHRONOLOGY, GROWTH, METHODOLOGY

265
Meeuse, A.D.J. 1960 Notes on the Sapotaceae of southern Africa. **Bothalia 7**:317-380
DISTRIBUTION, IDENTIFICATION AID, TAXONOMY

266
Meeuse, A.D.J. 1961 A key to the identification of the Sapotaceae of Southern Africa, based on vegetative characters. **Journal of the South African Forestry Association 38**:19-32
This is a more concise treatment of the family based on vegetative characters and short descriptions. See also 265.
IDENTIFICATION AID, TAXONOMY

267
Mentis, M.T. 1974 Distribution of some wild animals in Natal. **Lammergeyer 20**:1-68
DISTRIBUTION, FAUNA

268
Milewski, A.V. 1982 The occurrence of seeds and fruits taken by ants versus birds in Mediterranean Australia and southern Africa, in relation to the availability of soil potassium. **Journal of Biogeography 9**:505-516
BIRD, FRUIT, INTERACTION, INVERTEBRATE, NUTRIENTS, REPRODUCTIVE BIOLOGY

269
Miller, O.B. 1922 Notes on the distribution of species in natural forests of the Transkeian Conservancy. **South African Journal of Natural History 3**:20-23
Interesting and uncertain ranges and occurrences of the following species are described: Trichilia emetica, Podocarpus latifolius, Vepris lanceolata, Ptaeroxylon obliquum, Dais cotinifolia, Olea capensis subsp. macrocarpa and Ficus spp. The basic idea is that the trees will grow on any forest soil. Absence of these species in some places are rather due to a lack of pollination or seed-dispersal agents than to edaphic reasons.
DISPERSAL, DISTRIBUTION, ENVIRONMENT, INTERACTION, PHYTOGEOGRAPHY, REPRODUCTIVE BIOLOGY

270
Milton, S.J. 1982 Effects of shading on nursery grown Acacia seedlings. **Journal of South African Botany 48**:245-272
The paper describes the effects of shading on four species of phyllodinous Australian acacias naturalised in the southwestern

Cape. Acacia melanoxylon, a sub-climax species in rainforest and a weed in the Southern Cape forests, was the most shade tolerant and suffered minimal fall-off in dry matter production when growing in the shade. It required a minimum of only 20% daylight for growth. While the seedlings are suppressed in tall climax forest, they can become established in marginal and disturbed forest. Deeper shading may therefore be necessary for the control of A. melanoxylon.
ENVIRONMENT, EXOTIC, GROWTH, LIGHT, MORPHOLOGY, PROPAGATION

271
Mitchell, A.D. 1961 Random notes on Stinkwood (Ocotea bullata). **Journal of the South African Forestry Association 36**:11-13
Short notes are given on general distribution, exploitation, regeneration, and the timber. The only concentrations of the species are in the George-Knysna-Tsitsikamma forests and in the mountain forests of the Transkei. Over the rest of the country the species occurs only sporadically.
AUTECOLOGY, DISTRIBUTION, REGENERATION, TIMBER, UTILISATION

272
Mitchell, D.T. 1974 The role of fungi in our forests and woodlands. **Veld and Flora 4**(1):5-7
FUNGI, INTERACTION, ROOTS

273
Moll, E.J. 1965 **An account of the plant ecology of the Upper Mqeni Catchment.** Unpublished MSc thesis, University o f Natal, Pietermaritzburg.
COMMUNITY, ENVIRONMENT, PHYTOSOCIOLOGY, SPECIES LIST, VEGETATION TYPE

274
Moll, E.J. 1967 "Morton bush", a superb remnant of Karkloof. **Natal Wildlife 8**:2-3
COMMUNITY, CONSERVATION

275
Moll, E.J. 1967 **Forest trees of Natal.** Wildlife Protection and Conservation Society of South Africa, Durban. 170 pp.
DISTRIBUTION, IDENTIFICATION AID, SPECIES LIST

276
Moll, E.J. 1968 A quantitative ecological investigation of the Krantzkloof forest, Natal. **Journal of South African Botany 34**:15-25
A brief account of the location, topography, geology and climate of the area and a short qualitative description of the forest are given. Rainfall is 1 000 mm per annum, while mist occurs. The mean annual temperature is 18°C, altitude 300-500 m a.s.l. T.M.S. overlies Basement granite, with the contact zone at the base of the cliffs. An enumeration of the various synusiae

sampled and the different parameters employed are presented. Twenty six combinations of data were ordinated using the Wisconsin technique, and a method first employed by Woods & Moll (1966 unpublished: A quantitative ecological investigation of coast forest in Natal) was used to find the most efficient ordination. Performance of selected forest species is discussed with reference to environmental data collected at each sampling site.
COMMUNITY, ENVIRONMENT, PHYTOSOCIOLOGY

277
Moll, E.J. 1968 An account of the plant ecology of the Hawaan Forest, Natal. **Journal of South African Botany 34**:61-76
The location, physiography and climate of the Hawaan Forest are given. The general ecology of the forest margin and climax forest, with special reference to structure, composition and density of trees and shrubs from 50 random sample sites, and gap succession are outlined. A preliminary checklist of angiosperms occurring in Hawaan is appended.
DENSITY, ENVIRONMENT, SPECIES LIST, SUCCESSION

278
Moll, E.J. 1968 A plant ecological reconnaissance of the Upper Umgeni Catchment. **Journal of South African Botany 34**:401-420
A description is given of the seral and climax communities. Forest is the climatic climax vegetation between 1 200 and 1 800 m and usually occurs in patches on mesic, steep, south-facing slopes. Timber exploitation and grassland fires have caused the forests to diminish in size rapidly. Mistbelt Mixed Podocarpus forest and Mountain Podocarpus forest occur in the area.
COMMUNITY, FIRE, GRASSLAND, SPECIES LIST, SUCCESSION, TIMBER, UTILISATION, VEGETATION TYPE

279
Moll, E.J. 1968 Some notes on the vegetation of Mkuzi Game Reserve. **Lammergeyer 8**:25-30
Short general descriptions of the six basic vegetation types are provided. More detailed information regarding structure, dominant species and an exclosure study are provided for the Msinga Bush (Tongaland Sand forest).
HERBIVORY, VEGETATION STRUCTURE, VEGETATION TYPE

280
Moll, E.J. 1969 An investigation of the plant ecology of the Hawaan Forest, Natal, using an ordination technique. **Bothalia 10**:121-128
An account of the forest ecology using a slightly modified Wisconsin ordination technique is given. The river-facing slope is considered pre-climax, and the sea-facing slope subclimax, to the climax forest on the flat land. In addition, a secondary element resulting either from recent disturbance or possibly, from recently drier environmental conditions is shown to be present in the climax

forest. Most important climax species are Cavacoa aurea and Strychnos decussata.
COMMUNITY, ENVIRONMENT, PHYTOSOCIOLOGY, VEGETATION CHANGE

281
Moll, E.J. 1971 **Vegetation studies in the Three Rivers Region, Natal.** Unpublished PhD thesis, Univesity of Natal, Pietermaritzburg.
COMMUNITY, ENVIRONMENT, METHODOLOGY, PHYTOSOCIOLOGY, SPECIES LIST

282
Moll, E.J. 1972 The current status of Mistbelt Mixed Podocarpus forest in Natal. **Bothalia 10**:595-598
The known distribution and history of Mistbelt Mixed Podocarpus forest, its utilisation and destruction are discussed. It is suggested that there may be a general drying of the forest climate which is supported by evidence from canopy tree growth and regeneration. That this generally drier period has contributed to the rapid rate of forest degradation is postulated, and the need for implementation of conservation measures to ensure the safety of representative area of forest is stressed.
CLIMATE, CONSERVATION, DISTRIBUTION, HISTORY, REGENERATION, UTILISATION, VEGETATION CHANGE, VEGETATION TYPE

283
Moll, E.J. 1972 A preliminary account of the dune communities at Pennington Park, Mtunzini, Natal. **Bothalia 10**:615-626
A general description of Pennington Park is given, and some of the more important environmental factors affecting the plant communities are discussed. The structure, distribution and ecology of the various dune communities, from pioneers to Dune forest, are given.
COMMUNITY, DUNE, ENVIRONMENT, SUCCESSION, VEGETATION STRUCTURE

284
Moll, E.J. 1974 **A preliminary report on the Dwesa Forest Reserve, Transkei.** Wildlife Society of South Africa, Pinetown & University of Cape Town Wildlife Society, Rondebosch. 12 pp. + 7 Appendices
A short description is given of the location, environment and major plant communities of the area. Appendices list forest trees, ferns, seaweeds, birds, frogs and mammals found. Recommendations were put forward for the conservation of the area. The forest is interesting because it occurs on clayey, droughty soils close to the coast. The floristic composition is unique.
AMPHIBIAN, BIRD, COMMUNITY, CONSERVATION, ENVIRONMENT, FERN, MAMMAL, PHYTOGEOGRAPHY, SOIL, SPECIES LIST

285
Moll, E.J. 1975 Some new and some recent tree records from Natal. **Veld and Flora 61**(2):15-19
DISTRIBUTION, FLORA

286
Moll, E.J. 1976 **The vegetation of the Three Rivers Region, Natal.** Natal Town and Regional Planning Report 33, Town and Regional Planning, Pietermaritzburg.
COMMUNITY, ENVIRONMENT, METHODOLOGY, PHYTOSOCIOLOGY, SPECIES LIST

287
Moll, E.J. 1977 A plea for the Gwalaweni forest, Zululand. **Trees in South Africa 29**:17-23
This forest, about 500 ha in extent, is at 480-550 m a.s.l on top of the Lebombo mountain range midway between Jozini and Ingwavuma, and faces mostly eastward and southward. The annual rainfall at Ingwavuma is 1 000 mm per annum. Soil is deep and loamy, and the fogs that frequently cloak the mountain may supplement the adequate, evenly dispersed rainfall. In deeper valleys and south-facing slopes the forest canopy is over 30 m high with well-defined sub-canopy strata and an open shrub layer. Floristically the forest is unique but similar to forests of Oribi Gorge and Dwesa (Transkei coast). An annotated checklist is provided.
CONSERVATION, ENVIRONMENT, MONTANE, SPECIES LIST, VEGETATION STRUCTURE, VEGETATION TYPE

288
Moll, E.J. 1977 The vegetation of Maputaland - a preliminary report on the plant communities and their present and future conservation status. **Trees in South Africa 29**:31-58
COMMUNITY, CONSERVATION, VEGETATION TYPE

289
Moll, E.J. 1978 A quantitative floristic study of a forest in Krantzkloof Nature Reserve, Natal. **Lammergeyer 26**:29-37
The area of forest occurs at two levels on steep terrain - a portion above Table Mountain Sandstone cliffs approximately 100 m high, and a portion below the cliffs. Density data from 12 stands of 40x40 m were collected: 4 above and 8 below the cliffs. Results are tabulated for each portion of forest and show that the most dense and homogenous forest is above the cliffs. This portion is at an earlier stage in succession. It is apparent that certain canopy trees, paticularly the more common ones above the cliffs, are not regenerating well and that the composition of the canopy will change in time.
COMMUNITY, DENSITY, ENVIRONMENT, PHYTOSOCIOLOGY, REGENERATION, SUCCESSION, VEGETATION CHANGE

290
Moll, E.J. 1978 A quantitative floristic comparison of four Natal forests. **South African Forestry Journal 104**:25-34
Density and local frequency data of woody species occurring in three synusiae in four areas of indigenous forest in Natal are given. Three of the forests were within 16 km of the coast

and one was 93 km inland. The forests are: Hawaan 30 m a.s.l., sandy soils), Hlogwene 30 m a.s.l., sandy soils), Krantzkloof 300 m a.s.l., steep slopes, shallow sandy loam to sandy clay and Karkloof 1220 m a.s.l., steep, clayey soils). Results for each synusium are tabulated, and show that each forest is characterised by few species. The three forests near the coast are similar, differing from the others inland.
COMMUNITY, DENSITY, FLORA, PHYTOSOCIOLOGY, SOIL, VEGETATION STRUCTURE

291
Moll, E.J. 1978 A plea for Ngoye forest. **Trees in South Africa 30**:61-70
A short description is given of the forest and moves for its conservation. An annotated list of trees is provided.
COMMUNITY, CONSERVATION, SPECIES LIST

292
Moll, E.J. 1980 Additional quantitative ecological studies in the Hawaan forest, Natal. **South African Forestry Journal 113**:16-25
The Hawaan Forest was chosen as an experimental area where two parameters (i.e. density and frequency), various sample sizes (i.e. 10x10, 10x20, 20x20, 20x40 and 40x40 m) and synusial combinations (i.e. shrubs, intermediate and canopy) could be studied with a view to ascertaining which set of information would yield the most ecologically meaningful results in an analysis. Hawaan was selected because the forest ecology was already fairly well understood. In addition, density, local frequency, homogeneity and regeneration of the woody species occurring in the three synusiae recognised were studied. The results of the ordination showed that canopy tree density data for the 20x20 m sample gave the best ordination. The forest ecology is related to the three topographic aspects present in Hawaan. Canopy and intermediate trees show much clearer patterns on the ordination than do shrub species.
DENSITY, ENVIRONMENT, INTERACTION, METHODOLOGY, PHYTOSOCIOLOGY, REGENERATION, VEGETATION STRUCTURE

293
Moll, E.J. 1980 A quantitative ecological study of the Hlogwene forest, Natal. **South African Forestry Journal 114**:19-24
The ecology of Hlogwene Forest, an area of relatively homogenous Coast Forest, was studied from floristic data of woody species collected from 24 20x40 m stands. The results indicate that the forest had at least three synusiae of woody species, and that only a few species are dominant in any one synusia. A consideration of the regeneration of canopy species indicates that in time the floristic composition of the forest will alter. The results of an ordination study indicate that canopy frequency data from a 20x20 m stand contains the most ecologically meaningful information, and that the forest was exploited to some extent in the past.

PHYTOSOCIOLOGY, REGENERATION, SUCCESSION, UTILISATION, VEGETATION STRUCTURE

294
Moll, E.J. 1980 Terrestrial plant ecology. In: Bruton, M.N. & Cooper, K.H. (eds.) **Studies on the ecology of Maputaland.** Rhodes University, Grahamstown, and Wildlife Society, Durban. p.52-68
The vegetation is characterized by an abrupt pattern of local change because of the rapid changes in climate and soils. The complex mosaic of forest types, bushland, thicket, wooded and edaphic grassland has led to speculation on the dynamics of the vegetation. Much of the natural vegetation has been destroyed and replaced by secondary, fire-maintained grassland and wooded grassland. Of the 15 major vegetation types described, four are forest types and one a thicket. These are briefly described and indicated on a map.
CLIMATE, FIRE, INTERACTION, SOIL, VEGETATION CHANGE, VEGETATION TYPE

295
Moll, E.J. 1981 The Southern Cape forests. **Trees in South Africa 33**:2-11
The account presents a review on the phytogeographical relationships and the present and future conservation status of the Southern Cape forests.
CONSERVATION, FORESTRY, PHYTOGEOGRAPHY

296
Moll, E.J. 1981 **Trees of Natal.** Eco-Lab Trust Fund. University of Cape Town, Rondebosch.
The book provides a comprehensive field guide to over 700 indigenous and naturalized species of Natal. This includes a comprehensive but simple key, with simple line diagrams of the leaves and a simplified distribution map.
DISTRIBUTION, IDENTIFICATION AID, SPECIES LIST

297
Moll, E.J. 1983 A new tree record for the Cape Peninsula. **Veld & Flora 69**(1):31
The occurrence of Cassine eucleiformis in the Orange Kloof forest, Table Mountain, is described.
DISTRIBUTION

298
Moll, E.J. & Cooper, K.H. 1966 Hlogwene Forest, report by the Natal Fieldwork Section. **African Wildlife 20**:321-326
COMMUNITY, CONSERVATION, FLORA

299
Moll, E.J. & Haigh, H. 1966 A report on the Xumeni forest, Natal. **Forestry in South Africa 7**:99-108
COMMUNITY, CONSERVATION, FLORA

300
Moll, E.J. & Pierce, S.M. 1975 The use of the profile diagram technique as a tool for describing vegetation structure with special reference to the Dwesa forest, Transkei. **Trees in South Africa 27**:2-10
METHODOLOGY, VEGETATION STRUCTURE

301
Moll, E.J. & Scott, L. 1982 **Trees and Shrubs of the Cape Peninsula.** Eco-Lab Trust Fund, University of Cape Town, Rondebosch.
DISTRIBUTION, IDENTIFICATION AID

302
Moll, E.J. & White, F. 1978 The Indian Ocean coastal belt. In: Werger, M.J.A. (ed.) **Biogeography and ecology of Southern Africa.** W. Junk, The Hague. p.561-598
The Indian Ocean Coastal Belt is both a regional transition zone and a regional mosaic with a higher proportion of endemic species than other African transition zones and mosaics. The complexity of its chorological relationships is comparable to that of the Afromontane Region. Rapid local changes in climate and soil are responsible for a complex mosaic of different vegetation types. About 40% of the larger woody plants are endemic with the majority of them falling in a northern or southern group. The floras of the northern and southern parts of the Coastal Belt, part of one continuum, are divided into two major phytochoria - the Zanzibar-Inhambane and the Tongaland-Pondoland transitional and mosaic regions with the Limpopo river as the boundary. The most important differences are discussed. The Tongaland-Pondoland regional mosaic extends from the mouth of the Limpopo River (25°S) to about Port Elizabeth (34°S). It lies mostly below the Afromontane Region, but owing to the compensating effects of latitude many Afromontane species descend to sea-level. In general, the forests of the "mistbelt" are essentially Afromontane in contrast to those at lower altitudes which include many endemic Tongaland-Pondoland species and are mostly much less rich in epiphytic lichens, bryophytes, ferns and orchids. The vegetation of Tongaland-Pondoland comprises Acock's Veld Types no. 1, 2, 6, 10, 23 and 24. Types 3 and 5 are transitional between Afromontane and Tongaland-Pondoland vegetation and overwhelmingly tropical in affinity in contrast to other vegetation at comparable latitudes elsewhere in South Africa. Both regional mosaics are complexes of forest types, woodland bushland, thicket, wooded grassland, grassland and aquatic and semi-aquatic communities. The Tongaland-Pondoland regional mosaic includes five main forest types. Sand forest, dune forest, swamp forest and fringing forest occupy specialized sites. The undifferentiated lowland forest is more widely distributed, evergreen with a varying proportion of semi-deciduous species.
ENVIRONMENT, FLORA, PHYTOGEOGRAPHY, VEGETATION STRUCTURE, VEGETATION TYPE

303
Moll, E.J. & Woods D.B. 1971 The rate of forest tree growth and a forest ordination at Xumeni, Natal. **Bothalia 10**:451-460
The rate of increment in circumference at breast height of canopy tree species in the southern temperate, mist-belt forest at Xumeni, Natal, is very slow. The mean for all trees calculated from measurements in 1929 and 1966 is 5,10 ± 0,38 mm per year. Results from an ordination analysis of 39 plots were interpreted in terms of a successional gradient from seral sites on deep ground, characterised by Kiggelaria africana, Xymalos monospora and Zanthoxylum davyi, to climax sites on flatter ground with Podocarpus spp. Two climax types are indicated, with P. henkelli on moist soil and P. falcatus on drier soils.
COMMUNITY, ENVIRONMENT, GROWTH, PHYTOSOCIOLOGY

304
Morris, J.W. 1967 **Descriptive and quantitative plant ecology of Ntshongweni, Natal.** Unpublished MSc thesis, University of Natal, Pietermaritzburg.
COMMUNITY, ENVIRONMENT, METHODOLOGY, PHYTOSOCIOLOGY, VEGETATION CHANGE

305
Morris, J.W. 1969 An ordination of the vegetation of Ntshongweni, Natal. **Bothalia 10**:89-120
The physiography, soils, climate and dense woody vegetation are briefly described for this cone-shaped hill near Durban, Natal. A primary ordination of the woody plants was carried out using 60 quadrats. Edaphic and atmospheric moisture conditions and slope aspect were proposed as the main site factors correlated with species performance. The vegetation was subjected to intense disturbance prior to about 1920. Comparison of aerial photographs taken in 1937 and 1959 has shown the change in tree cover in the absence of tree felling and cultivation.
COMMUNITY, ENVIRONMENT, METHODOLOGY, PHYTOSOCIOLOGY, VEGETATION CHANGE

306
Muir, J. 1929 The vegetation of the Riversdale area, Cape Province. **Memoirs of the Botanical Survey of South Africa 13**:1-82
The climate and geology are discussed for the Strandveld, Renosterveld, Langebergen and Klein Karoo, the natural divisions of the area. The vegetation of each region is described in detail. Forest is found in ravines and rocky sites, mostly on southern aspects, at altitudes between 150 m and 400 m. Composition of these forests corresponds to that described by Phillips (1925) for the Knysna area, however, with fewer component species. The principal trees are: Cunonia capensis, Curtisia dentata, Olea capensis subsp. macrocarpa, Hartogia schinoides, Diospyros whyteana, Maytenus acuminata, Maytenus heterophylla, Pterocelastrus tricuspidatus, Scolopia mundii, Apodytes dimidiata, Olinia ventosa, Podocarpus latifolius, Burchellia bubalina and Rothmannia capensis. The mountains consist of Table Mountain Sandstone. Rainfall is comparable to that at Grootvadersbosch (1 000 mm/year). In the

river valleys in the Strandveld, e.g. the Kaffirkuils, where Bokkeveld Shales have been exposed by the action of the water, the vegetation has a close affinity with that of Renosterveld, and not the Strandveld, and form a river scrub. Sideroxylon inerme is the most prominent tree with several other smaller trees and shrubs (500-600 mm rain/year).
ENVIRONMENT, SPECIES LIST, VEGETATION TYPE

307
Muir, J. 1937 The seed-drift of South Africa and some influences of ocean currents on the strand vegetation. **Memoirs of the Botanical Survey of South Africa 16**:1-124
The contents and viability of seeds in the see drift collected mainly from the coast at East Londen and Riversdale are discussed. Several forest species are included.
DISPERSAL, FRUIT, SPECIES LIST

308
Nanni, U.W. 1969 Veld management in the Natal Drakensberg. **South African Forestry Journal 68**:5-15
The effects of grassland fires on forest vegetation are discussed. Comments are raised on the distribution of forest in the grassland during historic times. The ecology of these forests is related to that of temperate forests in the Southern Cape. The new approach of Wicht (1949) is used to study droughts (Wicht, C.L. 1949. Forestry and water supplies in South Africa. Department of Forestry Bulletin 33, Government Printer, Pretoria).
DROUGHT, FIRE, GRASSLAND, MANAGEMENT, VEGETATION CHANGE

309
Nanni, U.W. 1971 The Mokobulaan Research catchments. **South African Forestry Journal 78**:5-13
The account includes a small section on the forest vegetation. The area is located on a spur isolated by deep gorges at about 1 400 m above sea level (25°17'S, 30°45'E). The range runs in a north-south direction. The catchments are on the basal shales, highly arenaceous, with many bands of sandstones and quartzite grading into shale. The soil is clayey sand interspersed with shale and sandstone fragments. Along streamsides, especially southern banks, pockets of deep loamy soil occur. Annual rainfall is 1 034 mm with 82% falling October-March. Light frost occurs in the hollows during very cold winter nights. Maximum temperatures never exceed 38°C. The catchment is almost entirely grassland. The frequent grass fires inhibit the formation of a distinct forest marginal zone so that the transition to forest is abrupt. However, some typical forest margin species such as Rhamnus prinoides, Halleria lucida, Calpurnia intrusa, Myrsine africana, Bowkeria sp. and Maytenus sp. and the climber Rhoicissuss tridentata occur on the edge only under the forest trees. The general canopy level of the streamside forest is 10-12 m. This forest is a mixture of evergreen species without any obvious dominants, with some lianes and a few deciduous species. The forest is of

no economic value but owing to its sparseness, its aesthetic value is high. It is valuable cover to many species of small wildlife.
COMMUNITY, CONSERVATION, ENVIRONMENT, FIRE, GRASSLAND, SOIL

310
Neethling, J.H. 1970 **Classification of some forest soils of the Southern Cape.** Unpublished MSc thesis, University of Stellenbosch, Stellenbosch.
ENVIRONMENT, SOIL

311
Nicholson, H.B. 1982 The forests of the Umtamvuna River Reserve. **Trees in South Africa 34**:2-10
The report lists the stem number by species for eight plots in the forest of the reserve.
COMMUNITY, DENSITY, SPECIES LIST

312
Northey, V.R. 1974 Indigenous trees on the Twelve Apostles. **Journal of the Botanical Society of South Africa 60**:34-39
DISTRIBUTION, MONTANE, SPECIES LIST

313
Oatley, T.B. 1970 Predatory behaviour by the Samango monkey, Cercopithecus mitis. **Lammergeyer 11**:64
An observation is noted of nest observation by this monkey in the Kilgobbin temperate evergreen forest at Dargle, Natal.
BEHAVIOUR, BIRD, INTERACTION, MAMMAL

314
Oatley, T.B. 1971 Birds of our indigenous forests. In Newman, K. (ed.) **Birdlife in Southern Africa.** Purnell, Cape Town.
BIRD, DISTRIBUTION, HABITAT

315
Oatley, T.B. 1982 The starred Robin in Natal. Part 1: Behaviour, territory and habitat. **Ostrich 53**:135-146
Starred Robin Pogonocichla stellata were studied in forests in the Natal Midlands - Kilgobbin Forest, Winterskloof and Two Streams. Aspects of behaviour are described. Unlike many other forest birds the Starred Robin has a quiet song and is seldom aggressive toward conspecifics; males nevertheless effectively defend territories in the breeding season. Such areas invariably contain at least one thicket of dense undergrowth, and range in size from 0,50 to 0,75 ha. The extent of the territory and the effective range of the song are evidently related. A method is described for assessing forest structure.
BEHAVIOUR, BIRD, DISTRIBUTION, HABITAT, METHODOLOGY, VEGETATION STRUCTURE

316
O'Conner, M.J. 1976 Orchids of the forest floor in Natal. **Veld and Flora 62**:20-21
FLORA, SPECIES LIST

317
Odendaal, P.B. 1974 Last of the Buffalo. **Forestry in South Africa:15**:69-70
DISTRIBUTION, MAMMAL

318
Odendaal, P.B. & Bigalke, R.C. 1979 Habitat selection by bushbuck in a disturbed environment. **South African Forestry Journal 108**:39-41
The use by bushbuck (Tragelaphus scriptus) of exotic pine and eucalypt plantations, as well as indigenous forests, was investigated by radio-tracking five animals on the Kruisfontein State Forest, near Knysna. Preference indices were drawn up for various habitat zones. Eucalyptus areas were actively avoided, but some of the pine areas preferred, even to indigenous forest. An attempt is made to explain these preferences.
BEHAVIOUR, EXOTIC, HABITAT, MAMMAL, METHODOLOGY

319
Olivier, M.C. 1977 A systematic checklist of the spermatophyta of the Baakens River Valley, Port Elizabeth. **Journal of South African Botany 43**:145-159
FLORA, SPECIES LIST

320
Palgrave, K.C. 1977 **Trees of southern Africa.** Struik, Cape Town. 959 pp.
Keys to groups, families, genera and species are provided. Each species is provided with a description, line drawing and distribution map.
DISTRIBUTION, IDENTIFICATION AID, SPECIES LIST

321
Palmer, A.R. 1981 **A study of the vegetation of the Andries Vosloo Kudu Reserve, Cape Province.** Unpublished MSc thesis, Rhodes University, Grahamstown.
COMMUNITY, PHYTOSOCIOLOGY, SPECIES LIST

322
Palmer, E. & Pitman, N. 1972 **Trees of Southern Africa,** Volumes 1-3. A.A. Balkema, Cape Town.
This work covers all known indigenous species in the Republic of South Africa, South-West-Africa, Botswana, Lesotho and Swaziland. Apart from the detailed botanical data, a vast store of historical, geographical, medicinal, nutritional, agricultural and palaeontological data is presented. This is an improved version of the original one-volume work published in 1961.

DISTRIBUTION, HISTORY, IDENTIFICATION AID, SPECIES LIST, UTILISATION

323
Pentz, J.A. 1945 **An agro-ecological survey of Natal.** Bulletin 250, Department of Agriculture and Forestry, Government Printer, Pretoria.
LAND USE, SOIL, UTILISATION, VEGETATION TYPE

324
Phillips, E.P. & Kotze, J.J. 1920 The occurrence of "Terblanz" (Faurea macnaughtonii Phill.) in Natal and Pondoland. **South African Journal of Science 17**:221
It is confirmed that Terblanz occurs in the Knysna forest, then appears in the Pondoland forests, and reappears in the Ngome forest in northern Natal.
PHYTOGEOGRAPHY

325
Phillips, J.F.V. 1921 The Alexandria forests. **South African Gardening and Country Life 11**:217, 219, 257-258, 276
COMMUNITY, VEGETATION TYPE

326
Phillips, J.F.V. 1923 Disease in young natural regeneration of Olea laurifolia Lem. **South African Journal of Natural History** 4(3):209-20
A brief general description of the flowering and fruiting aspects of Olea capensis subsp. macrocarpa is given, with notes on dispersal and viability of the fruits. Cetain major diseases of the regeneration and influences of the respective fungal and insect diseases are dealt with in general terms.
AUTECOLOGY, FRUIT, FUNGI, INVERTEBRATE, PHENOLOGY, REGENERATION, REPRODUCTIVE BIOLOGY

327
Phillips, J.F.V. 1924 The biology, ecology and sylviculture of 'Stinkwood' Ocotea bullata E. Mey: Introductory Studies. **South African Journal of Science 21**:275-292
The distribution, community and habitat relations, habit, reproductive biology and successional relations are outlined. The nature of the acarodomatia on the leaves and chief points in the histology of the leaf are discussed, and symbiotic and pathological relations are touched upon. Growth rate is dealt with briefly. Silvicultural practices related to this species are discussed.
AUTECOLOGY, DISTRIBUTION, FUNGI, GROWTH, HABITAT, INTERACTION, PROPAGATION, REPRODUCTIVE BIOLOGY, SUCCESSION

328
Phillips, J.F.V. 1925 Platylophus trifoliatus D. Don: A contribution to its ecology. **South African Journal of Science 22**:144-160

The distribution, community and habitat relations, habit, reproductive biology and successional relationships of this monotypic genus in the Knysna forests are described. The possible reasons for the restricted range of the species are discussed.
AUTECOLOGY, DISTRIBUTION, FRUIT, HABITAT, PHYTOGEOGRAPHY, REPRODUCTIVE BIOLOGY, SUCCESSION

329
Phillips, J.F.V. 1925 Experimental vegetation: The use of South African indigenous tree seedlings as phytometers. **South African Journal of Science 22**:197-214
An attempt is made to indicate the potential use of certain South African indigenous tree seedlings as phytometers, using the growth response (height increment, fresh and dry mass, number of leaves and leaf product increases) as measurements of either the whole environment or of isolated factors of the latter. Natural, free and control phytometers are defined briefly, and examples of data yielded by experimental cultures of free, light intensity control and holard percentage. Control phytometers are given. It is considered likely that the tree seedlings will prove of value as phytometers as our knowledge of their life-histories and requirements increases.
ENVIRONMENT, GROWTH, HABITAT, METHODOLOGY, SOIL

330 Phillips, J.F.V. 1925 The Knysna elephant: A brief note on their history and habitats. **South African Journal of Science 22**:287-293
BEHAVIOUR, HABITAT, HISTORY, MAMMAL

331
Phillips, J.F.V. 1925 The plant as a measure of the habitat. **Nature 117**:1931
ENVIRONMENT, GROWTH, HABITAT, METHODOLOGY

332
Phillips, J.F.V. 1926 The biology of the flowers, fruits and young regeneration of Olinia cymosa Thunb. ('Hard Pear'). **Ecology 7**:338-350
AUTECOLOGY, FRUIT, REGENERATION, REPRODUCTIVE BIOLOGY

333
Phillips, J.F.V. 1926 Virgilia capensis Lamk. ('Keurboom'): A contribution to its ecology and sylviculture. **South African Journal of Science 23**:435-454
The restricted distribution, habitat preferences, growth habit and reproductive biology of this important tree of the forest ecotone in the Southern Cape is discussed. The successional relations of this light-demanding species are described. The tree is of use in silviculture, affording excellent cover to seedlings of other forest species. It is readily raised from seed, and transplants readily. Natural stands often require

thinning so as to obtain the best increment. Virgilia is the fastest-growing native tree of the Knysna forest.
AUTECOLOGY, DISTRIBUTION, GROWTH, HABITAT, PROPAGATION, REPRODUCTIVE BIOLOGY, SUCCESSION

334
Phillips, J.F.V. 1926 General biology of the flowers, fruits and young regeneration of the more important species of the Knysna forests. A summary of preliminary studies. **South African Journal of Science 23**:366-417
The production, pollination, dispersal, mortality and phenology of the reproductive parts of 63 species of trees and shrubs of the Knysna forests are described in tabular form. Germination requirements of the species are summarised. These are the results of phenological studies of definitely marked trees over a period of three and a half years, a study of the structure of flowers and fruits, pollination experiments under natural and controlled conditions, observations and experiments associated with dispersal of fruit and seed, and nursery and quadrat germination experiments.
DISPERSAL, FRUIT, PHENOLOGY, POLLINATION, PROPAGATION, REGENERATION, REPRODUCTIVE BIOLOGY

335
Phillips, J.F.V. 1926 The propagation of 'Stinkwood' (Ocotea bullata E. Mey.) by vegetative means. **South African Journal of Science 23**:418-434
The delicate nature of the shoots of Ocotea is described and the occurrence of a strongly lignified stereome and of U-shaped stone cells in the pericycle is discussed. The influence of these features upon formation of callus and of adventitious roots is discussed. These features are responsible for the poor response by the species to all attempts - horticultural, chemical and etiolation, using leaves, root-cuttings, trancheons and layers - to propagate it vegetatively.
MORPHOLOGY, PROPAGATION

336
Phillips, J.F.V. 1926 'Wild pig' (Potamochoerus choeropotamus) at the Knysna: Notes by a naturalist. **South African Journal of Science 23**:655-660
The pig, its general distribution in South Africa, its habitat preferences in the Knysna forest and population biology is briefly discussed. The interaction of this animal with the forest, especially its principal food species and its effect on dispersal and predation of seed are given some attention.
DISPERSAL, DISTRIBUTION, HABITAT, INTERACTION, MAMMAL

337
Phillips, J.F.V. 1926 Phytometry in the Knysna forests. **Carnegie Institute Washington Year Book 25**:346-347
ENVIRONMENT, GROWTH, HABITAT, METHODOLOGY

338
Phillips, J.F.V. 1926 Succession and climaxes in the Knysna Region. **Carnegie Institute Washington Year Book 25**:365-367
SUCCESSION

339
Phillips, J.F.V. 1926 Rainfall interception by plants. **Nature, London 118**:837-838
HYDROLOGY, WATER RELATIONS

340
Phillips, J.F.V. 1927 Faurea macnaughtonii Phill ('Terblanz'): a note on its ecology and distribution. **Transactions of the Royal Society of South Africa 14**:317-336
The only population of this species in Lilyvlei forest in Gouna near Knysna is described as to community and habitat relationships and reproductive biology. The discontinuous distribution of the species is considered. It is held that the wide-ranging species F. speciosa and F. saligna were responsible for the appearance of F. macnaughtonii in Transvaal and Natal. The occurrences of Terblanz in Transkei and at Gouna are attributed to polygenesis that has taken place. It is held that the species is extending its limits gradually at Gouna.
AUTECOLOGY, DISTRIBUTION, HABITAT, PHYTOGEOGRAPHY, REGENERATION, REPRODUCTIVE BIOLOGY

341
Phillips, J.F.V. 1927 Mortality in the flowers, fruits and young regeneration of trees in the Knysna forest of South Africa. **Ecology 8**:435-444
FRUIT, MORTALITY, REGENERATION, REPRODUCTIVE BIOLOGY

342
Phillips, J.F.V. 1927 Fossil Widdringtonia in lignite of the Knysna series with a note on fossil leaves of several other species. **South African Journal of Science 24**:188-197
Fossil wood from lignite of the Knysna Series is described macro- and microscopically. It is identified as Widdringtonia, possibly W. nodiflora. Fossil leaves existing in the brown sand layers are descibed and identified as those of Podocarpus falcatus, Gonioma kamassi and possibly Curtisia dentata.
FOSSIL, PALAEOECOLOGY

343
Phillips, J.F.V. 1927 Ekebergia capensis Sparrm. ('Essenhout') in the Knysna Region: A preliminary ecological note. **South African Journal of Science 24**:216-224
This species occurs scattered through the Knysna forest in medium-moist and dry forest types. The habitat relationships and reproductive biology are discussed. Several points of silvicultural value are briefly described.
AUTECOLOGY, DISTRIBUTION, HABITAT, REPRODUCTIVE BIOLOGY

344
Phillips, J.F.V. 1927 Dendrographic experiments. Ocotea bullata E. Mey. ('Stinkwood'). **South African Journal of Science 24**:227-243
A preliminary account is given of the dendrographic data collected from one tree with MacDougal's dendrometer. Habitat factors had considerable influence on the daily fluctuations in diameter. Permanent increment, i.e. radial growth, proceeded throughout the year, with no seasonal rhythm. The only periods of reduced growth coincided with unfavourable weather conditions. Artificial irrigation and reduction of transpiring surface by lopping off portions of the crown reduced the amplitude of the daily fluctuations. Sap was shown to ascend in the 2nd to 5th growth rings, several of which may be formed in one year.
GROWTH, METHODOLOGY, PHENOLOGY, WATER RELATIONSHIPS

345
Phillips, J.F.V. 1927 Experimental vegetation: a second contribution. **South African Journal of Science 24**:259-268
The results summarise the effect of a series of intensive large-scale felling and cultural experiments in the Knysna forests. The investigations attempted to relate the growth and establishment of selected indigenous trees and weeds to the resulting changes in forest soils. It was concluded that exposure of a forest soil is detrimental to the establishment, development and growth of forest regeneration.
GROWTH, PROPAGATION, REGENERATION, SOIL, UTILISATION

346 Phillips, J.F.V. 1927 The role of the 'Bush-dove' Columba arquatrix T. & K. in fruit-dispersal in the Knysna forests. **South African Journal of Science 24**:435-440
The bird, its habits and life are briefly outlined. The correlation of the influx of the bird with the full fruiting season of Olea capensis subsp. macrocarpa is pointed out. The principal species dispersed by the bird are listed. Examples of crop capacity are given. The time required for germination of a number of Knysna forest seeds is appreciably shortened because the seeds are passed through the stomach of the bird. It is concluded that this pigeon is more useful than harmful.
BEHAVIOUR, BIRD, DISPERSAL, FRUIT, INTERACTION, REPRODUCTIVE BIOLOGY

347
Phillips, J.F.V. 1927 Experimental vegetation in the Knysna forests. **Carnegie Institute Washington Year Book 26**:320-322
GROWTH, HABITAT, PROPAGATION, REGENERATION

348
Phillips,J.F.V. 1927 Growth and regeneration in sub-tropical forests. **Carnegie Institute Washington Year Book 26**:326
GROWTH, REGENERATION

349
Phillips, J.F.V. 1927 Succession and forest types in the Knysna region. **Carnegie Institute Washington Year Book 26**:333-334
COMMUNITY, SUCCESSION, VEGETATION TYPE

350
Phillips, J.F.V. 1928 The behaviour of Acacia melanoxylon R. Br. ('Tasmanian blackwood') in the Knysna forests. **Transactions of the Royal Society of South Africa 16**:31-43
This species was introduced to the Knysna indigenous forests on a silvicultural scale in 1909. The object was the killing of the weed growth on exploited sites and assisting natural regeneration of indigenous trees. Observations showed that while the weeds were killed by the exotic, natural regeneration of tree species was either absent or poor under its stands. Experiments showed that reduced light intensity and moisture content of the soil was responsible for this. The species seeds efficiently and abundantly and the seed lies dormant for many years. The species is unlikely to spread in undisturbed forest because the seed requires scarification or heat for germination and the seedlings are relatively light demanding.
AUTECOLOGY, ENVIRONMENT, EXOTIC, INTERACTION, REPRODUCTIVE BIOLOGY, TIMBER, UTILISATION, WATER RELATIONSHIPS

351
Phillips, J.F.V. 1928 Olea laurifolia Lam. ('Ironwood'): an introduction to its ecology. **Transactions of the Royal Society of South Africa 16**:169-190
The ecologically important tree Olea capensis subsp. macrocarpa of the Knysna forest is described as to dimensions, habit, community and habitat relations and distribution. Best development of the tree occurs in the moist to medium-moist forests of the Southern Cape. It is a shallow-rooted species with a very heavy crown, very susceptible to wind-throw. Leaf anatomy is described. The principal mortality factors of all stages in the life cycle are mentioned. Diameter growth is slow, as is the height growth of seedlings. The ecological importance of the species lies in its reduction of light, a superficial root system drawing strongly upon soil moisture of upper layers and a strong regenerating capacity.
AUTECOLOGY, BIOMASS, COMMUNITY, DISTRIBUTION, GROWTH, HABITAT, INTERACTION, MORPHOLOGY, MORTALITY, ROOTS, WINDFALL

352
Phillips, J.F.V. 1928 Curtisia faginea Ait. ('Assegaai'): An ecological note. **Transactions of the Royal Society of South Africa 17**:29-41
The distribution, habit, community and habitat relations, reproductive biology, growth and mortality factors of the species are generally described. It is a tree of the moist to medium-moist forest and is semi-light demanding. Stem diameter growth is slow, but comparable to the other major species of the Knysna forest.

AUTECOLOGY, DISTRIBUTION, GROWTH, HABITAT, MORTALITY, REPRODUCTIVE BIOLOGY

353
Phillips, J.F.V. 1928 The principal forest types in the Knysna region - an outline. **South African Journal of Science 25**:188-201
The main types within the climax and sub-climax Knysna forests are described. They are based upon mean holard at 30-45 cm soil depth, upon the floristic features of the ground flora and shrub vegetation, and upon the floristics and growth in the upper layers. The main types are the dry type, medium-moist type and moist type. A coastal dry/medium-moist type and a montane moist type in the mountain kloofs are recognized as habitat modifications. The general nature, habitat, ecological history and silvicultural possibilities of the three main types and of the two habitat modifications are described in more detail.
COMMUNITY, FLORA, HABITAT, SOIL, VEGETATION STRUCTURE, VEGETATION TYPE, WATER RELATIONS

354
Phillips, J.F.V. 1928 Plant indicators in the Knysna region. **South African Journal of Science 25**:202-224
A general account is given of the potential use of plants as indicators of particular site factors, complexes, processes and practices. In particular the indicators of various forest types and of quality and intensity of exploitation are discussed.
DISTURBANCE, ENVIRONMENT, HABITAT, UTILISATION

355
Phillips, J.F.V. 1928 Turacus corythaix corythaix Wagl. ('Loerie') in the Knysna forests. **South African Journal of Science 25**:295-299
The bird, its habits and life is briefly outlined. The bird disperses a large number of fruits (berries and drupes) of a wide range of forest trees, shrubs, and lianes. Very few of these are destroyed in passing through the stomach of this dispersal agent. A certain amount of harm is done by the bird dislodging immature fruits.
BEHAVIOUR, BIRD, DISPERSAL, FRUIT, INTERACTION

356
Phillips, J.F.V. 1928 Influence of forest formation upon soil moisture. **Nature**, July 14
HYDROLOGY, INTERACTION, SOIL, VEGETATION TYPE, WATER RELATIONS

357
Phillips, J.F.V. 1929 The influence of Usnea sp. (near barbata Fr.) upon the supporting tree. **Transactions of the Royal Society of South Africa 27**:101-107
Research results and general observation indicated that this bearded lichen is detrimental to the two podocarps in the Knysna forests. The fungal component is parasitic upon the tissues

external to (and sometimes internal to) the cork-cambium. Vigorous crowns may be infected as well as defective ones. The lichen cannot develop luxuriantly under conditions of light, temperature and humidity prevailing in undisturbed high forest. However, it grows apace when these conditions are severely and suddenly altered by heavy exploitation. Preservation of the forest canopy seems to be the best means of inhibiting the rampant development of the lichen.
DISTURBANCE, ENVIRONMENT, EPIPHYTE, GROWTH, HABITAT, INTERACTION, LICHEN, MORPHOLOGY, UTILISATION

358
Phillips, J.F.V. 1930 Fire: its influence on biotic communities and physical features in South and East Africa. **South African Journal of Science 27**:352-367
An attempt is made to outline the more important, more easily discernable changes in the vegetation following fire, in (i) climax grassland, (ii) tree-and-grass savanna developing to either deciduous or evergreen scrub climaxes, (iii) macchia or fynbos, (iv) subtropical and tropical evergreen forest.
FIRE, FYNBOS, GRASSLAND, SUCCESSION, VEGETATION CHANGE

359
Phillips, J.F.V. 1931 Forest succession and ecology in the Knysna Region. **Memoirs of the Botanical Survey of South Africa 14**:1-327
The physical environment of the forests (including geology, topography, soils, climate and microclimate) is described. Floral, structural and tree density data for various forest types are given. The author compares natural succession with recovery after burning and exploitation. Appendices contain notes on the behaviour of exotic Acacia melanoxylon in the forests, on the reproductive biology, phenology, dispersal and propagation of indigenous trees, as well as vegetation maps and 82 photographs.
CLIMATE, COMMUNITY, DEMOGRAPHY, DISPERSAL, ENVIRONMENT, EXOTIC, FIRE, FLORA, HISTORY, PHENOLOGY, PHYTOGEOGRAPHY, REPRODUCTIVE BIOLOGY, SUCCESSION, UTILISATION, VEGETATION TYPE

360
Phillips, J. 1931 The root nodules of Podocarpus. **South African Journal of Science 28**:252
Seedlings of Podocarpus falcatus and P. latifolius grown in sterilised soil, and therefore, without nodules, were non-thrifty and succumbed early. Control seedlings grown in non-sterilised soil, and, therefore, showing nodules, developed normally. The watering of seedlings growing in sterilised soil, and lacking nodules, with an infusion of bacteria from Podocarpus nodules or from cultures of Pseudomonas radicicola grown from such nodules, enabled the plants to form nodules, and to grow relatively vigorously.
FUNGI, INTERACTION, ROOTS

361
Phillips, J. 1932 Root nodules of Podocarpus. **Ecology** 13:189-195
FUNGI, INTERACTION, ROOTS

362
Phillips, J. 1963 **The forests of George, Knysna and the Zitzikama - a brief history of their management 1778-1939.** Government Printer, Pretoria.
The forest policy and forest management between 1778 and 1939 in several short periods are reviewed. Other chapters report on felling seasons, improvement and departmental fellings, increment statistics and working plans, a brief history of the introduction of exotics into the forests, forest fires and forest creek concession (a clearfelled forest area).
FIRE, FORESTRY, HISTORY, MANAGEMENT, UTILISATION

363
Pirie, G.H. 1982 Railway plantations and railway sleepers in South Africa, 1910-1937. **South African Forestry Journal 122**:59-62
Sleeper timber was largely imported, supplemented by purchases mainly of yellowwood from the woodcutters in the Knysna indigenous forests.
TIMBER, UTILISATION

364
Plumstead, E.P. 1973 Trees of the distant and more recent past in South Africa. **South African Forestry Journal 88**:1-5
An abbreviated history of plant life of Africa is presented. Four epoch making events in earth history which have controlled the distinctive character of our vegetation are discussed. The origin of our softwoods and hardwoods, probably through the Glossopteridophyta, is considered. The modern forest flora, especially in the Cape, reflects its ancient heritage, although it has advanced considerably. Strongest links, sometimes even at the species level, exist between floras of South Africa, South America and Australia.
CLIMATE, EVOLUTION, FLORA, ORIGIN, PALAEOECOLOGY, PHYTOGEOGRAPHY

365
Poduschka, W. 1982 Extinction at work. **Custos 10**(12)
Forest habitat preference and food of the Giant Golden Mole in the Pirie forests are briefly discussed. Its diet is limited to the large earthworms which occur in the area.
BEHAVOIUR, HABITAT, INTERACTION, INVERTEBRATE, MAMMAL

366
Pole Evans, I.B. 1920 The Veld: its resources and dangers. **South African Journal of Science 17**:5-34
South Africa is divided into 19 botanical regions which are briefly characterised to show that the main types of vegetation are intimately associated with the physical features of the

country. Reference is made to many forest patches throughout the country.
ENVIRONMENT, FLORA, SPECIES LIST, VEGETATION TYPE

367
Pole Evans, I.B. 1923 The main botanical regions of South Africa. **Memoirs of the Botanical Survey of South Africa 4**:49-53
VEGETATION TYPE

368
Pole-Evans, I.B. 1936 A vegetation map of South Africa. **Memoirs of the Botanical Survey of South Africa 15.**
Three main types of forest are distinguished: Evergreen and deciduous bush and subtropical forest, temperate evergreen forests, and evergreen sclerophyllous bush. The distribution and characteristics of each type are briefly discussed.
MAP, VEGETATION TYPE

369
Pooley, A.C. 1968 A short note on the diet of the vervet monkey Cercopithecus aethiops in Zululand. **Lammergeyer 9**:29-31
The plants and fruits included in the diet of the monkey in the Ndumu and Mkuzi Game Reserves are listed. The role of the monkey in dispersing seeds of many trees and shrubs is recorded.
DISPERSAL, FRUIT, INTERACTION, MAMMAL

370
Poynton, J.C. & Broadley, D.G. 1978 Herpetofauna. In: Werger, M.J.A. (ed.) **Biogeography and ecology of Southern Africa.** W. Junk, The Hague. p.925-948
AMPHIBIAN, FAUNA, REPTILE, SPECIES LIST

371
Poynton, R.J. 1971 **Characteristics and uses of trees and shrubs.** Bulletin 39, Department of Forestry, Pretoria.
GROWTH, HABITAT, PROPAGATION, UTILISATION

372
Rawdon, B.B. 1956 Birds in the Ngoye forest. **African Wildlife 10**:163-164
The Ngoye forest, 24 km inland from Mtunzini on the Zululand Coast, is situated on the summit of the Ngoye hills, at an altitude of 600 m, a range running almost parallel to the coast. A few birds and their food, mainly berries, are recorded.
BIRD, DISPERSAL, ENVIRONMENT, FRUIT

373
Reitz, D. 1938 The forests of northern Zululand. **Journal of the South African Forestry Association 1**:28-29
The destruction of the forests from Sordwana Bay to Kosi Bay in northern Zululand over a period of 16 years is discussed.

It is concluded that: "The native is a connoisseur of land. By tradition, if not now by instinct, he recognises the value of forest soil for the growing of crops, and by applying this knowledge in the practice of his husbandry has played a great part in forest destruction in South Africa".
LAND USE, UTILISATION

374
Roberts, B.R. 1961 Preliminary notes on the vegetation of Thaba'Nchu. **Journal of South African Botany 27**:241-251
VEGETATION STRUCTURE, VEGETATION TYPE

375
Roberts, B.R. 1965 Applied plant ecology in land-use planning of catchments areas. **South African Journal of Science 61**:111-117
LAND USE, VEGETATION TYPE

376
Roberts, B.R. 1969 The vegetation of the Golden Gate Highlands National Park. **Koedoe 12**:15-28
COMMUNITY, FLORA, VEGETATION TYPE

377
Robertson, C.C. 1924 The forests of South Africa. **Empire Forestry Journal 3**:1-23
The first section describes the various classes of yellowwood, broad-leaved subtropical and coastal forest, scrub and savannah. The discontinuous distribution of Faurea macnaughtonii and other "shrubs representative of the south-western flora" is attributed to the reappearance at Port St Johns of the sandstone formations of the Western Cape.
DISTRIBUTION, PHYTOGEOGRAPHY, VEGETATION TYPE

378
Rogers, D.J. & Moll, E.J. 1975 A quantitative description of some coast forests of Natal. **Bothalia 11**:523-537
Ten stands of subtropical forest in four areas along the coast of Natal were sampled using five 0,1 acre circular plots in each stand. A total of 101 woody species over one inch D.B.H. was recorded, with a range of 20 to 40 species per stand. Quantitative results, including numbers and sizes, are given for canopy, sub-canopy, and understorey species. Specific size limits were used to recognize the three layers. Basal area per unit area was used as measure of relative dominance of various species and layers, and the possibility of a biological principle to justify such usage is mentioned. Although the stands are complex and are seemingly heterogenous, definite patterns of species behaviour and trends are indicated for the ten stands and the four forest areas. Relatively few species are dominant in each stand and the apparent diversity is mainly due to the high percentage of species that are relatively uncommon in each stand.

The methods described in this paper should be applicable in a study of a broader range of Natal forests.
DENSITY, DIVERSITY, DUNE, FLORA, METODOLOGY, PHYTOSOCIOLOGY, VEGETATION STRUCTURE

379
Roos, T.J. 1967 (Geographical influences on forestry in the Western Cape, Central Cape and Eastern Cape Regions and Transkei.) **Geografiese invloede op die bosboubedryf in die Wes-Kaapstreek, die Kaap-Middellandstreek, die Oos-Kaapstreek en die Transkei.** Unpublished PhD (Geography) thesis, University of Stellenbosch, Stellenbosch. 338 pp.
The historical development in the utilisation and management of the indigenous forests in relation to exotic plantations are described. Climatic and site factors influencing the occurrence of forests are discussed. The human factor in the utilisation of the forests includes recreation potential and industrialisation. The main emphasis is on the development of plantation forestry in regional context.
ENVIRONMENT, EXOTIC, FORESTRY, HISTORY, LAND USE, PLANTATION, RECREATION, UTILISATION

380
Ross, J.H. 1972 The flora of Natal. **Memoirs of the Botanical Survey of South Africa 39**:1-418
A key is provided to families and genera. Within each genus the species are listed with notes on districts in Natal where they occur.
DISTRIBUTION, FLORA, IDENTIFICATION AID, SPECIES LIST, TAXONOMY

381
Rosseau, F. 1966 Story of the forests. **South African Panorama 11**(12):36-41
VEGETATION TYPE

382
Rowe-Lowe, T. 1972 Distibution of the African Weasel Poecilogale albinucha Gray, in southern Africa. **Lammergeyer 15**:59-64
The majority of records (64%) are from wooded or open woodland areas with 4,6% records from forest or scrub forest.
DISTRIBUTION, HABITAT, MAMMAL

383
Rowe-Rowe, D.T. & Meester, J. 1982 Habitat preferences and abundance relations of small mammals in the Natal Drakensberg. **South African Journal of Zoology 17**:202-209
Small mammals were studied in a South African montane region at elevations ranging from 1 500 to 3 000 m in the Giants Castle Game Reserve. Small mammal numbers, species richness, and diversity in the different habitats (fire climax grassland with patches of forest, scrub and woodland, in the montane, sub-alpine and alpine belts). Trap success in forest was lower than in any of the

scrub habitats. Myosorex varius, Mus minutoides, Dendromus mesomelas and Graphiurus murinus were collected in the climax Olinia forest with Podocarpus.
DENSITY, DIVERSITY, HABITAT, MAMMAL, MONTANE

384
Russell, S. 1982 Humidiy gradients and bryophyte zonation in the Afromontane forests of the Eastern Cape, South Africa. **Journal Hattori Botanical Laboratory 52**:299-302
Patterns of vertically differentiated epiphytic bryophyte communities are described for the warm temperate to subtropical forests of the Eastern Cape, which are related to subcanopy humidity gradients. These patterns provide a means of differentiating moist and dry forest types and are expected to be of use in formulation of a more detailed forest classification for the area under study.
HABITAT, MONTANE, MOSS, SPECIES LIST, VEGETATION TYPE, WATER RELATIONS

385
Rutherford, M.C. 1978 Primary production ecology in Southern Africa. In: Werger, M.J.A. (ed.) **Biogeography and ecology of Southern Africa.** W. Junk, The Hague. p.621-659
Existing information relating to net primary production of main vegetation types, including forest, is discussed. Data presented for forests cover biomass (basal area) for the Southern Cape and Natal. Forest communities with basal area up to 40 m^2/ha include some of the North Coast of Natal while basal area between 40 and 50 m^2/ha include the temperate forests of the Southern Cape. Communities with basal area between 50 and 130 m^2/ha include three marsh forests with highest basal area value (maximum of 144 m^2 ha) for two water course forests, all on the north coast of Natal. Annual radial increments of woody species of the Southern Cape and Natal mist belt forests usually average between 0,5 and 1,0 mm per individual per year, whereas several savanna tree species appear to increase in the order of 2 or 3 mm per individual per year.
BIOMASS, DENSITY, GROWTH

386
Rycroft, H.B. 1943 **The plant ecology of the Karkloof Forest.** Unpublished MSc thesis, University of Natal, Pietermaritzburg.
CLIMATE, ENVIRONMENT, FIRE, SPECIES LIST, SUCCESSION, UTILISATION, VEGETATION TYPE

387
Rycroft, H.B. 1944 The Karkloof forest, Natal. **Journal of the South African Forestry Association 1**:14-25
A general account of the climate of the Karkloof area is given, the succession from tall grass to forest (with Real Yellowwood the dominant species) is traced, and the forest itself described. As a result of fire, over-exploitation and cultivation, the forest is only about a quarter of its area in 1880. With adequate control further destruction might be prevented and the forest

might appear as it did many years before. The forest is probably the largest (6 000 - 8 000 ha) remnant of indigenous forest in Natal. It is situated in the mistbelt of the Karkloof range, west of Howick. This range is part of the escarpment between the 900 - 1 200 m terrace, composed of sandstones and shales of the Beaufort Series, and traversed by numerous dolerite sills and dykes. The south to southeast aspect of the escarpment favors forest development. The critical period for forest development is probably late winter - early spring when humidity is depressed by the desiccating 'Berg-wind'. Within the forest the temperature conditions are milder and more equable than those typical of the summer rainfall climate in Natal. The Karkloof range acts as a barrier to the southeast Trade Winds, so that mean annual rainfall increases as the escarpment is approached from the southeast and diminishes again to the northwest (rain shadow).
CLIMATE, ENVIRONMENT, FIRE, SUCCESSION, UTILISATION

388
Rycroft, H.B. 1980 **Tsitsikamma trees: trees of the Tsitsikamma National Park.** National Parks Board, Pretoria.
IDENTIFICATION AID, SPECIES LIST

389
Schalke, H.J.W.G. 1973 The upper Quaternary of the Cape Flats area (Cape Province, South Africa). **Scripta Geologica 15**:1-57
This report on the Rietvlei sequence indicates relative frequencies of Podocarpus pollen, sometimes but not invariably associated with Ilex mitis and Curtisia dentata.
CLIMATE, PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

390
Scheepers, J.C. 1978 The vegetation of Westfalia Estate on the North-eastern Transvaal escarpment. **Memoirs of the Botanical Survey of South Africa 42**:1-230
Land use in this area is discussed against the historical backgound. Environmental factors, especially climatic, are described in some detail. The area is divided into climatic zones. The vegetation is divided into three altitudinal belts subdivided into vegetation zones, which largely correspond with the climatic zones. The vegetation belts are: the Montane-Forest Belt (mainly above 1 200 m altitude); the Scrub-Forest Belt (mainly between 900 and 1 200 m) and the Savanna-Woodland Belt (mainly below 900 m). The Low Scrub Forest Zone and the High Scrub-Forest Zone of the Scrub-Forest Belt, and the Lower, Middle and Upper Montane Forest Zones of the Montane-Forest Belt are described. An account of secondary vegetation is given. The vegetation is also discussed in relation to conservation, including a description of the Trema Plantation project. In the appendices the floristics are discussed and a check-list of 1 255 species is included.
CLIMATE, CONSERVATION, ENVIRONMENT, FLORA, FORESTRY, HISTORY, MONTANE, SPECIES LIST, SUCCESSION, VEGETATION STRUCTURE, VEGETATION TYPE

391
Scheepers, J.C. 1983 The present status of vegetation conservation in South Africa. **Bothalia 14**:991-995
Progress with conservation of representative stands of the great variety of South African ecosystems, as represented by vegetation types, is reviewed against progress towards better coordinated and national planning of the various conservation activities pursued by different conservation authorities. The report notes the ongoing survey by the Wildlife Society of Southern Africa to determine the whereabouts, condition, composition, etc. of all forests in private ownership.
CONSERVATION, VEGETATION TYPE

392
Scheepers, J.C., Van der Schijff, H.P. & Keet, J.D.M. 1968 An ecological account of the Trema plantations of Westfalia Estate. **Tydskrif vir Natuurwetenskappe 8**:105-120
The historical background of improvident exploitation followed by efforts at conservation and restoration of natural resources on Westfalia Estate is given. Attempts to use plantations of an indigenous pioneer tree, Trema orientalis, for the restoration of the natural vegetation, soil and water resources are referred to. The taxonomic position of this species is briefly discussed. Trema plantations were established in the Low Country with varying, but usually slight, success. Trema did not thrive in the Mistbelt, but a plantation established there has been partially successful since being underplanted with other indigenous trees. The implications of the project in relation to water conservation and soil restoration are discussed. The properties of the timber are briefly mentioned. The present and future prospects are reveiwed in relation to seed provenance and it is suggested that T. orientalis may repay further investigations in terms of its productivity potential, as well as its use for conservation purposes.
CONSERVATION, FORESTRY, GROWTH, PROPAGATION, UTILISATION

393
Schonland, S. 1919 Phanerogamic flora of the divisions of Uitenhage and Port Elizabeth. **Memoirs of the Botanical Survey of South Africa 1**:1-118
A section on the forest patches is included.
FLORA, PHYTOGEOGRAPHY, SPECIES LIST, VEGETATION TYPE

394
Schoonraad, E. 1973 (The distribution of the genus Podocarpus L'Herit ex Pers. in South Africa and the morphology of the wood.) Die verspreiding van die genus Podocarpus L'Herit ex Pers. in Suid-Afrika en die morfologie van die hout. **Tydskrif vir Natuurwetenskappe 13**:116-135
Four Podocarpus species occur in South Africa, i.e. P. elongatus, P. falcatus, P. henkelii and P. latifolius. The distribution in the coastal areas of the southern and eastern Cape Province, Natal

and eastern and northern Transvaal is discussed. A distribution map is supplied.
DISTRIBUTION, MORPHOLOGY, PHYTOGEOGRAPHY

395
Scorer, J. 1980 **Some factors affecting the feeding ecology and socio-biology of the Samango monkey, Cercopithecus albogularis schwarzi Roberts 1931.** Unpublished MSc thesis, University of Pretoria, Pretoria.
BEHAVIOUR, FRUIT, HABITAT, MAMMAL

396
Scott, L. 1982 A Late Quaternary pollen record from the Transvaal Bushveld, South Africa. **Quaternary Research 17**:339-370
CLIMATE, PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

397
Scott, L. 1983 Palynological evidence for vegetation patterns in the Transvaal (South Africa) during the late Pleistocene and Holocene. **Bothalia 14**:445-449
Palynological evidence relating to the nature of Late Quaternary vegetation types and plant migrations in the Transvaal is briefly discussed. It is suggested that, after an early temperate, relatively moist phase and a subsequent relatively dry phase lasting until about 25 000 yr B.P., a vegetation type with ericaceous elements developed. The earliest Wonderkrater pollen zone, formed earlier than 30 000 yr B.P. with a large component of arboreal pollen, includes Podocarpus (<34%) and Oleaceae (<14%), suggesting that the montane forests in the Waterberg were more extensive. Presence of Kiggelaria pollen (<23%) supports the idea of wetter conditions.
CLIMATE, PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

398
Scott-Shaw, R. 1974 Witteklip forest. **Trees in South Africa 26**(2):30-39
A general description of this Tsitsikamma coastal forest and its associated tree species are given.
COMMUNITY, SPECIES LIST

399
Scriba, J.H. 1984 **The indigenous forests of the Southern Cape. A location study.** Unpublished MA thesis, Geography Department, University of Stellenbosch, Stellenbosch.
The aim with this study was to evaluate, both statistically and experimentally, the location pattern of the local forests by a selected group of physical and human factors. A multivariate approach was followed to analyse the different criteria both at regional and local levels. The location pattern of the forest was well explained by the individual impact of precipitation, but also by slope, geological formation, aspect and rural settlement. Macro-terrain, rainfall and geological formations had important

impacts on forest cover on a regional basis, with hardly any interactions between these factors. Factorial effects warranted the division of the region into three local areas. In the main forest area around Knysna, forest cover is directly explained by the impact of macro-terrain, rainfall geology, micro-terrain, altitude and rural settlement. In the George area geology, with no important factor interactions and micro-terrain were important with factor interactions becoming more pronounced. In the Tsitsikamma impact of most factors and many interactions were highly significant. This was attributed to the distance between the mountains and coast. A prediction of the potential forest cover for the George mountain forest study area indicated that only one-eighth of the potential forest area is still presently forested.
DISTRIBUTION, ENVIRONMENT, HISTORY, LAND USE, METHODOLOGY, VEGETATION CHANGE, VEGETATION TYPE

400
Seagrief, S.C. 1950 **Studies on the plant ecology of Fern Kloof near Grahamstown.** Unpublished MSc thesis, Rhodes University, Grahamstown.
COMMUNITY, FLORA, PHYTOSOCIOLOGY, SPECIES LIST

401
Seagrief, S.C. 1965 Establishment of Podocarpus latifolius in Blackwood plantations at the Hogsback. **South African Journal of Science 61**:433-437
EXOTIC, FORESTRY, PROPAGATION, REGENERATION

402
Seydack, A.H.W. 1983 Large mammals of the forests. In: Odendaal, P.B. (ed.) **South African Forestry Handbook.** South African Institute of Forestry, Pretoria. p.331-339
The larger forest mammals are described for those concerned with their conservation, control or utilization within the forestry context. These include bushbuck, forest duikers, suni, bushpig, Cape porcupine, tree hyrax, leopard, honey badger, viverrids, and samango and vervet monkeys.
HABITAT, MAMMAL, SPECIES LIST, UTILISATION

403
Seydack, A.H.W. 1983 Indigenous forest management planning: A new approach. Proceedings of the Jubilee Symposia, University of Stellenbosch. **Foris 98**:525-553
Proposals for a management approach for the indigenous forests of the Southern Cape and Tsitsikamma are presented. Special attention is given to how the proposals provide for the resolution of conflicts between land use types, notably conservation versus timber utilisation. The importance of a logical management classification in multi-purpose management planning is discussed. Conflicting land use types are spatially segregated if the joint pursuit of multiple uses is not feasible due to resource nature or land use demands. Land use possibilities are identified and

priorities settled between them on an area-specific basis. Management principles are worked out so as to accommodate both conservation and timber utilization interests.
CONSERVATION, LAND USE, MANAGEMENT, TIMBER, UTILISATION

404
Seydack, A.H.W. 1984 Application of a photorecording device in the census of larger rain-forest mammals. **South African Journal of Wildlife Research 14**:10-14
An autotriggering photographic data-recording unit consisting of a camera with autowinder, flash system and trip plate, was tested as a method of studying larger mammals in the Knysna forests. Six units were positioned systematically along paths on 1 km^2 census blocks in the study area and consequently took six months to complete. Six survey cycles resulted in a total of 596 photographic animal records of 14 different species (bushbuck, blue duiker, grysbuck, bushpig, porcupine, baboon, rock hyrax, leopard, caracal, honey-badger, large-spotted genet, marsh mongoose, Cape grey mongoose, hadeda ibis). From the results, bushbuck Tragelaphus scriptus population density estimates of between 5 and 7 animals per km^2 were obtained. The results of the study indicate that the technique has great potential for census and research of mammals inhabiting dense vegetation types.
BEHAVIOUR, DENSITY, MAMMAL, METHODOLOGY, SPECIES LIST

405
Short, L.L. 1971 Notes on South African woodpeckers. **Ostrich 42**:89-98
Two days were devoted to investigations in the Mount Sheba Nature Reserve, an area of evergreen forest on the Transvaal Escarpment, where the Olive Woodpecker was observed.
BEHAVIOUR, BIRD

406
Sim, T.R. 1900 Botanical observations on forests of eastern Pondoland. **Agricultural Journal of the Cape of Good Hope 16**:21-42, 104-115
SPECIES LIST

407
Sim, T.R. 1907 **The forests and forest flora of the Colony of the Cape of Good Hope.** Taylor & Henderson, Aberdeen. 561 pp.
The book is divided into three parts. The first part covers the area, value and economic composition of the forests and the factors affecting them. The second part, the major section, contains a synoptical index and artificial key to the genera and systematic descriptions of the species of the forest flora. The third part contains illustrations of the species.
CONSERVATION, DISTRIBUTION, FLORA, HISTORY, IDENTIFICATION AID, MANAGEMENT, PHYTOGEOGRAPHY, SPECIES LIST, TAXONOMY, UTILISATION

408
Sim, T.R. 1926 Some effects of man's influence on the South African flora. **South African Journal of Science 23**:492-507
FLORA, VEGETATION CHANGE

409
Simpson, M.W. & Talbot, P.H.B. 1946 An enumeration of fungi collected at Qudeni Forest Reserve, Zululand, in February, 1945. **South African Journal of Science 42**:131-134
Fungi are listed and the type and species of indigenous tree hosts indicated. Data are provided on the weather conditions during collection.
FUNGI, HABITAT, SPECIES LIST

410
Skead, C.J. 1964 Birds of the Amatole Forests, King William's Town and Stutterheim, C.P. **Ostrich 35**:142-159
BIRD, SPECIES LIST

411
Skead, C.J. 1964 The overland flights and feeding habits of the Cape Parrot, Poicephalus robustus (Gmelin) in the Eastern Cape Province. **Ostrich 35**:228-233
BEHAVIOUR, BIRD

412
Skead, C.J. 1971 The Cape Parrot in the Transkei and Natal. **Ostrich Supplement 9**:165-178
BIRD, DISTRIBUTION

413
Skead, C.J. & Liversidge, R. 1967 Birds of the Tsitsikamma Forest and Coastal National Park, 1966. **Koedoe 10**:43-62
BIRD, HABITAT, SPECIES LIST

414
Skinner, G. & Yates, M.J. 1974 **Our trees.** Express Litho Services, Port Elizabeth. 51 pp.
Identification of fifty common trees indigenous to the Eastern Cape Province. Line drawings of leaves, flower and fruit, and notes on distribution and cultivation are provided for each species.
DISTRIBUTION, IDENTIFICATION AID, PROPAGATION

415
Smithers, R.H.N. 1983 The mammals of the Southern African subregion. University of Pretoria, Pretoria. 736 pp.
BEHAVIOUR, DISTRIBUTION, HABITAT, MAMMAL

416
Speight, W.L. 1967 Knysna forests. **Public Servant 47**(5):48-49
VEGETATION TYPE

417
Spilhaus, M.W. 1950 **Indigenous trees of the Cape Peninsula.** Juta & Co., Cape Town. 122 pp.
Short notes and photographs of 26 common indigenous trees in the Cape Peninsula are provided.
HISTORY, IDENTIFICATION AID, UTILISATION

418
Stander, E. 1936 (The George-Knysna-Tsitsikamma forest region.) **Die George-Knysna-Zitzikamma bosstreek.** Unpublished MA thesis (Geography), University of Stellenbosch, Stellenbosch.
DISTRIBUTION, ENVIRONMENT, VEGETATION TYPE

419
Stapleton, C.C. 1937 **Common Transvaal Trees.** Bulletin 37, Department of Forestry, Pretoria.
The paper describes some of the most common Transvaal trees, some of which grow in forests.
DISTRIBUTION, ENVIRONMENT, IDENTIFICATION AID

420
Stapleton, C.C. 1955 The cultivation of indigenous trees and shrubs. **Journal of the South African Forestry Association 26**:10-17
Rates of growth of various indigenous trees under various conditions are recorded and suggestions are made regarding their artificial establishment. Results from experimental plantings in the Southern Cape and Northern Transvaal are given.
GROWTH, PROPAGATION, REGENERATION

421
Stebbins, I.F. 1909 **A taxonomic study of the trees of the Cape Colony, analytical key based on leaf characters.** Unpublished MA thesis, Oberlin College.
IDENTIFICATION AID, MORPHOLOGY, TAXONOMY

422
Stirton, C.H. 1972 A note on the flowers of Halleria lucida. **Bothalia 12**:223-224
Studies of sunbirds (Cinnyris spp.) feeding on the nectar of flowers of Halleria lucida suggest that partial protandry may be operative in the breeding system of this cauliflorous tree. Attention is drawn to certain anomalies depicted in published botanical drawings. These anomalies are discussed in relation to the sequential development of the androecium and gynoecium in live flowers. Colius colius, the speckled coly, is reported to eat the fruits of H. lucida. This bird also feeds on nectar after piercing the base of the corolla tube.
BIRD, DISPERSAL, MORPHOLOGY, POLLINATION, REPRODUCTIVE BIOLOGY

423
Stokoe, T.P. 1954 Some impressions and reflections of a plant

collector. **Journal of the Botanical Society of South Africa 40**:25-27
The paper reports that much of the crest of the Klein River Mountain, between Stanford and Akkedisberg Outspan, was covered by a dense and moist section of forest. It was regarded as a refuge from the prevailing southeasterly winds, and had defied all efforts to burn it. However, about 1888 the forest was repeatedly cut down and then burnt on a dry, hot day. Thirty years afterwards the only trace of tree growth was a few shoots of Cunonia capensis between some rocks.
DISTURBANCE, VEGETATION CHANGE

424
Story, R.A. 1952 Botanical survey of the Keiskammahoek District. **Memoirs of the Botanical Survey of South Africa 27**:1-228
The physical features of the area is described. The section on Woodlands covers scrub, bush, dry forest and moist forest. With a few exceptions, the definite associations and consociations and their seral equivalents such as Phillips (1931) describes for the Knysna forests were not a feature of the Keiskammahoek forests. The studies were done with special reference to the encroachment of Acacia scrub.
ENVIRONMENT, SPECIES LIST, SUCCESSION, VEGETATION CHANGE, VEGETATION TYPE

425
Stuart, C.T. 1981 Notes on the mammalian carnivores of the Cape Province, South Africa. **Bontebok 1**:1-58
Information gathered over a period of four years on the distribution, status, reproduction, feeding and body measurements of the 28 mammalian carnivores known to occur in the Cape Province are presented. Southern and Eastern Cape forest are distinguished. The following carnivores are noted: Canis mesomelas, Aonyx capensis, Poecilogale albinucha (fringe), Ictonyx striatus, Genetta genetta, Genetta tigrina, Herpestes ichneumon, H. pulverelentus, Atilax paludinosus, Panthera pardus, Felis libyca, F. serval and F. caracal.
BEHAVIOUR, DISTRIBUTION, HABITAT, MAMMAL

426
Stuart, J.S.N. 1920 **The effects of storms on certain forests in the Tsolo District, Cape Province.** Bulletin 2, Union of South Africa Department of Forestry, Government Printer, Pretoria.
CLIMATE, DISTURBANCE, WINDFALL

427
Taylor, H.C. 1955 Forest types and floral composition of Grootvadersbosch. **Journal of the South Africa Forestry Association 26**:33-46
The physical features of the region are mentioned briefly. Rainfall averages 994 mm over the period 1936-1953. The forest lies in the contact zone between the shale series of the undulating

plains and Table Mountain Sandstone of the Langeberg mountains at altitude 450 m a.s.l. The Knysna forest types cannot be applied directly to Grootvadersbosch. The main types are briefly described. An appendix lists all plants found within the forest.
COMMUNITY, ENVIRONMENT, FLORA, SPECIES LIST, VEGETATION TYPE

428
Taylor, H.C. 1959 A coastal forest remnant near Stanford, Cape Province. **Journal of the Botanical Society of South Africa 45**:27
COMMUNITY, CONSERVATION, VEGETATION TYPE

429
Taylor, H.C. 1961 Ecological account of remnant coastal forest near Stanford, Cape Province. **Journal of South African Botany 23**:153-165
This account reports on two forest communities: Sideroxylon-Euclea Short Forest and Celtis-Olinia-Apodytes Tall Forest.
COMMUNITY, SPECIES LIST, VEGETATION TYPE

430
Taylor, H.C. 1961 The Karkloof forest, a plea for its protection. **Forestry in South Africa 1**:123-134
The Karkloof forest is about 1 500-2 000 ha in area and occurs under rather uniform conditions of aspect and rainfall. Its former area may have been up to four times its present extent. Most of the forest is of the mixed-dominant type in which Podocarpus falcatus is prominent and associated with a range of other species, including P. latifolius. In parts Celtis africana becomes dominant in association with Combretum kraussii. In the upper portions at an altitude of 1 500 m there is a fair admixture of Ocotea bullata, which in limited areas is associated with Podocarpus henkelii as a dominant species and constitutes the most economically valuable forest type. Both in the past and recent years much damage has been done by fire, over-exploitation, stripping of bark for native medicines, clearing for cultivation, and by grazing. It is concluded that the greater present danger lies in over-exploitation, which may be combatted by propagada stressing the value of the forest for water conservation, scientific study and its aesthetic appearance, as well as its importance as a source of beneficial insects and future timber supplies. Research directed towards the encouragement of regeneration is advocated.
CONSERVATION, DISTURBANCE, ENVIRONMENT, FIRE, HISTORY, REGENERATION, UTILISATION, VEGETATION TYPE

431
Taylor, H.C. 1962 A report on the Nxamalala forest. **Forestry in South Africa 2**:29-51
The Nxamalala forest of 3 200 ha, is threatened with total extermination. The remaining forest is mainly scrub with a mean height of 6 to 9 m or an open tangle of thorny shrubs and small trees. It is of the mixed dominant type with a variety of dominant

species. It once contained Ocotea bullata and Trichilia roka which are now very rare or absent. Active destruction is still proceeding today and is mainly due to illicit tree felling for hut poles and fighting sticks and the damage caused by fire and grazing animals. An important function of this forest is to prevent silt flowing into the streams which feed the nearby Henley Dam. Its present condition does not enable it to fulfil this function efficiently. It is recommended that the lower margins of the forest be protected by afforestation with exotics in order to eliminate the adjacent grassveld, which supports domestic grazing animals thereby providing the incentive to burn; that wattle plantations be established to supply the demand for hut poles; that the forest be preserved for scientific study and recreational purposes because of its proximity to Pietermaritzburg; and that research to ascertain the best means of rehabilitating the forest be undertaken.
CONSERVATION, DISTURBANCE, EXOTIC, FIRE, FORESTRY, GRASSLAND, SPECIES LIST, UTILISATION, VEGETATION STRUCTURE, VEGETATION TYPE

432
Taylor, H.C. 1983 The vegetation of the Cape of Good Hope Nature Reserve. **Bothalia 14**:779-784
The Reserve, 7 750 ha in extent, occupies the southern end of the Cape Peninsula. Two structural formations, fynbos and broad-leaved scrub, may be recognized on the Reserve. The broadleaved scrub is regarded as a simplified form of the coast forest of the Knysna region. On dune sands it forms thickets, 2-4 m high, of sprouting broad-leaved sclerophylls, dominated by Euclea racemosa and Sideroxylon inerme. On rocky screes of the western escarpment, better protected from fire, it develops into a gnarled mixed scrub of dwarf forest with a canopy height of 5 m with Pterocelastrus tricuspidatus, Tarchonanthus camphoratus, Maurocenia frangularia and Chionanthus foveolatus as principal tree species.
COMMUNITY, FIRE, FLORA, FYNBOS, VEGETATION STRUCTURE, VEGETATION TYPE

433
Taylor, H.C. & Morris, J.W. 1981 A brief account of coast vegetation near Port Elizabeth. **Bothalia 13**:519-525
The environment and five major vegetation categories of the coast between the Coega and Sundays river are described. The area contains elements of fynbos, grassland, subtropical to temperate coastal forest and possibly forest derived woody flora peculiar to semi-arid valleys of the Eastern Cape. Three forest precursor communities are described which all contain as dominants species fourd in the early successional stage of Coast forest. The Sundays River scrub is regarded as a derivative from Alexandria forest.
ENVIRONMENT, SUCCESSION, VEGETATION TYPE

434
Thiergaart, F., Frantz, R. & Raukopf, K. 1963 Palynologische

untersuchungen von Tertiarkohlen und einer oberflachen probe nahe Knysna, Sud-Afrika. **Advanc. Front. Plant Science 4**:151-178
PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

435
Theirgart, F., Frantz, R. & Raukopf, K. 1966 Summary of the pollen flora of Tertiary deposits near Knysna (Cape Province). **Palaeoecology of Africa 1**:100-102
High frequencies of pollens of Restionaceae and fern spores in addition to Podocarpaceae, Proteaceae and Myrtaceae are noted. Transported carbonized material in the samples are also recorded.
PALAEOECOLOGY, POLLEN, VEGETATION CHANGE

436
Thunberg & Kotze, J.J. 1940 Some Langeberg forests. **Journal of the South African Forestry Association 5**:32-40
Interesting notes relating to the forests and ecological and morphological characteristics of the forest species are recorded.
FLORA, MORPHOLOGY, SPECIES LIST, VEGETATION TYPE

437
Tinley, K.L. 1967 The moist Evergreen Forest - dry Semi-deciduous Forest Tension zone in north-eastern Zululand and hypotheses on past temperate/montane rain forest connections. In: Van Zinderen-Bakker, E.M. (ed.) **Palaoecology of Africa and the surrounding islands and Antarctica 2**:82-85
CLIMATE, PALAEOECOLOGY, PHYTOGEOGRAPHY, VEGETATION TYPE

438
Tinley, K.L. 1975 Habitat physiognomy, structure and relationships. **Symposium proceedings, New Series 97**:69-77. The Mammal Research Institute 1966-1975, University of Pretoria, Pretoria.
HABITAT, MAMMAL, VEGETATION STRUCTURE

439
Tinley, K.L. 1976 **The ecology of Tongaland.** Wildlife Society of southern Africa, Natal Branch, Durban.
SUCCESSION, VEGETATION TYPE

440
Tyson, P.D. (ed.) 1971 Outeniqualand: The George-Knysna Area. **The South African Landscape 2.** South African Geographical Society.
ENVIRONMENT, VEGETATION TYPE

441
Urton, N.R. 1952 The vegetation of the Van Staadens Pass picnic site. **African Wildlife 6**:212-216, 225-229
The more common trees, shrubs, creepers and lianas and the adjacent vegetation are briefly discussed. Interesting notes are provided on Trichocladus crinitus (Hamamelidaceae). The family is almost exclusively confined to the Northern Hemisphere, but is represented

in South Africa by this solitary genus whose presence is probably due to migration from the north by way of mountain ranges in East Africa. It is related to the European witchhazel, Hamamelis mollis. Onderbos occurs in forest patches from George to Natal.
DISTRIBUTION, PHYTOGEOGRAPHY, SPECIES LIST, VEGETATION TYPE

442
Vahrmeijer, J. 1966 Notes on the vegetation of Northern Zululand. **African Wildlife 20**:151-161
FLORA, VEGETATION TYPE

443
Van Daalen, J.C. 1980 **The colonisation of fynbos and disturbed sites by indigenous forest communities in the Southern Cape.** Unpublished MSc thesis, University of Cape Town, Rondebosch. 212 pp.
The study tested the hypothesis that the forest will successfully colonise suitable fynbos and disturbed sites adjoining the forest if fire or other disturbances are kept out for a sufficient period, and that a site is suitable for forest regeneration when the environmental and edaphic factors are comparable with those of the present forest. In general these hypotheses were rejected. Sites adjoining the forests were sampled with a 100x25 m grid across the forest edge. Height and cover of the vegetation, soil and environmental variables were recorded. The data were analysed by multivariate ordination techniques. For results see No. 445 & 446.
DISTURBANCE, ENVIRONMENT, FYNBOS, METHODOLOGY, REGENERATION, SUCCESSION

444
Van Daalen, J.C. 1981 [The effect of shading and methods of moisturing on the growth of seedlings of Podocarpus latifolius] Die invloed van beskaduwing en benattingsmetodes op die groei van Podocarpus latifolius-saailinge. **South African Forestry Journal 116**:82-88
Seed collected from P. latifolius was separated into large and small categories. The testas of the 72% seemingly viable seeds were cut for germination trials. Large seeds gave 39% germination compared to the 20% small seeds, with no significant effect of testa cutting. Watering by hand or by automatic mist sprayer were tested under shade intensities of 0, 25, 50 and 75%. Shoot length was the only parameter that was affected by both these treatments. The average N-content of the above-ground parts of plants watered by hand was 85% greater than of plants grown under the mist spray. Seedling growth was superior when seedlings were grown without shade and watered by hand.
FRUIT, GROWTH, LIGHT, PROPAGATION, REGENERATION, WATER RELATIONS

445
Van Daalen, J.C. 1981 Comparative soil bulk density determination in the Southern Cape forest-fynbos ecotone. **South African Forestry Journal 118**:82-85

Soil bulk densities were determined by a simplified excavation method. No difference between forest and fynbos soil bulk densities could be found. The B21 horizons were significantly denser than the A1 horizons.
ENVIRONMENT, FYNBOS, METHODOLOGY, SOIL

446
Van Daalen, J.C. 1981 The dynamics of the indigenous forest-fynbos ecotone in the Southern Cape. **South African Forestry Journal 119**:14-23
A hypothesis that the indigenous forest colonises fynbos and disturbed sites in the Southern Cape was tested by surveying the forest-fynbos ecotone and the adjoining fynbos and analysing the data by means of reciprocal averaging and factor analysis. On all study sites except one the ordination of the environmental factors with factor analysis showed no coincidence with the present forest-fynbos ecotone and it was concluded that the forest ecotone had been artificially induced on these sites. No forest species were regenerating in the adjoining fynbos. Possible reasons for this are closed nutrient cycles of the shallow-rooted trees, the inability of the trees to withstand regular burning and an unfavourable macro- and microclimate. Soil moisture is important, especially in the marginal areas. Except in the case of soils derived from Enon conglomerates or granites, soil type is not a limiting factor for forest development. Fynbos is not seral to forest, but a different vegetation type replacing forest where possible.
DISTURBANCE, ENVIRONMENT, FYNBOS, METHODOLOGY, REGENERATION, SUCCESSION

447
Van Daalen, J.C. 1983 General forest trees of South Africa. In: Odendaal, P.B. (ed.) **South African Forestry Handbook.** South African Institute of Forestry, Pretoria. p.317-330
Selected indigenous tree species are described briefly in respect of South African distribution, site requirements, morphological and cultural characteristics and timber properties.
DISTRIBUTION, HABITAT, MORPHOLOGY, PROPAGATION, TIMBER, UTILISATION

448
Van Daalen, J.C. 1984 Distinguishing features of forest species on nutrient-poor soils in the Southern Cape. **Bothalia 15**:229-240
Soils of the indigenous forest-fynbos interface in the Southern Cape were sampled for chemical and physical analyses and compared by means of analysis of variance. Correlations among soil variables were investigated by subjecting the correlation matrices to cluster analysis. Soil data were compared with that of fynbos and tropical forest areas. Morphological and physiological features of the forest vegetation, i.e. evergreenness, sclerophylly, phenolic compounds in the leaves, mast fruiting (i.e. gregarious

fruiting) and root mat, were correlated with the soil nutritional status.
FRUIT, FYNBOS, INTERACTION, METHODOLOGY, MORPHOLOGY, NUTRIENTS, SOIL, VEGETATION STRUCTURE

449
Van der Bijl, P.A. 1920 Additional host plants of Loranthaceae occurring around Durban. **South African Journal of Science 17**:185-186
INTERACTION, SPECIES LIST

450
Van der Merwe, C.V. 1976 (Plant-ecological aspects and management problems of the Goukamma Nature Reserve.) **Die plantekologiese aspekte en bestuursprobleme van die Goukamma-Natuurreservaat.** Unpublished M.Sc. thesis, University of Pretoria, Pretoria.
The Goukamma Nature Reserve near Knysna, 1 700 ha in extent, is situated on the sand dunes in the lakes area and borders on the Indian Ocean. The Braun-Blanquet table technique was used to classify the vegetation into smaller, more easily recognizable units. Eight groups of plant communities were identified, subdivided into 25 units and described in detail. The Sideroxylon inerme forest community occurs between the east-west running dunes. It is most extensively developed on a northern slope south of Groenvlei. It is subdivided into a Cussonia thyrsiflora community and a Zanthoxylum capensis community.
COMMUNITY, DUNE, ENVIRONMENT, MANAGEMENT, PHYTOSOCIOLOGY, VEGETATION TYPE

451
Van der Merwe, P. 1966 (The flora of Swartboskloof, Stellenbosch, and the recovery of species after a fire.) Die flora van Swartboskloof, Stellenbosch, en die herstel van die soorte na 'n brand. **Annals of the University of Stellenbosch A(14)**:691-736
The riverine and scree forest communities are described. Seven soil types, derived from Table Mountain sandstone and granite, correspond well with the two forest and five fynbos communities.
COMMUNITY, FIRE, FLORA, FYNBOS, SOIL

452
Van der Merwe, P. & Van der Merwe, D. 1968 Fire in Swartboskloof Nature Reserve. **African Wildlife 22**:147-157
Fynbos and forest plant communities were surveyed 35 months after a February fire which occurred after a 15-year fire-free period. Climax forest communities contained 11-22% fire therophytes (plants totally dependent on seed for regeneration after fire), as opposed to 27-42% of the fynbos communities.
COMMUNITY, FIRE, FYNBOS, REGENERATION

453
Van der Schijff, H.P. 1963 A preliminary account of the vegetation

of the Mariepskop complex. **Fauna and Flora 14**:42-53
See item 400.
FLORA, VEGETATION TYPE

454
Van der Schijff, H.P. & Schoonraad, E. 1971 The flora of the Mariepskop complex. **Bothalia 10**:461-500
The physiography, soils, climate and the main plant communities are briefly described. Mariepskop consists of the Black Reef Series (succession of shaly sandstones, quartzite, shales and shaly sandstones, and quartzite with conglomerate bands at base) on top of older granite. Mean annual rainfall is 1 370 mm. Mist is frequent. In 1969 there was 2 954 ha of indigenous forest in the reserve. Patches of submontane forest occur in moist and sheltered kloofs at 760 m (635-760 mm rain), mostly on the northern and western slopes. On the eastern foothills the forests have mostly been replaced by plantations. A very large part of the Mariepskop-Magalieskop complex is covered with evergreen montane forest, which attains maximum development in deep kloofs and on southern or southeastern slopes.
COMMUNITY, ENVIRONMENT, FLORA, FORESTRY, PHYTOSOCIOLOGY, SPECIES LIST

455
Van der Zee, D. & Skinner, J.D. 1977 Preliminary observations on Samango and Vervet Monkeys near Lake Sibaya. **South African Journal of Science 73**:381-382
BEHAVIOUR, MAMMAL

456
Van Laar, A. & Geldenhuys, C.J. 1975 Distribution and correlation patterns in an indigenous forest. **South African Forestry Journal 94**:20-28
The study was carried out in a group of compartments, covering 530 ha in the Bloukrans State Forest. The sample consisted of 650 circular plots of 0,04 ha. The analysis revealed some significant correlations between site factors (aspect and slope) and stand characteristics, between density of regeneration and stand characteristics and intercorrelations amongst stand variables. The beta-function was fitted to the observed diameter and basal area distributions. The normal distribution, however, more satisfactorily expressed the basal area distribution of all species combined. A sampling intensity of 0,88% is required to bring the maximum error, with a confidence coefficient of 0,95, within 5%. The sampling study was combined with a pilot study of linear correlations, sampling technique, beta function, systematic sampling, plotless distance sampling of the efficiency of distance methods. Distance to the nearest tree produced a negative bias, but to the second-, third- and fouth-nearest trees gave satisfactory results. In comparison with the standard method of determining the basal area in plots with a fixed radius, distance methods require more

measurements to obtain the same precision. In forests with dense undergrowth, however, they might be applied to a greater advantage.
BIOMASS, DENSITY, ENVIRONEMNT, INVENTORY, METHODOLOGY, REGENERATION

457
Van Laar, A. & Geldenhuys, C.J. 1975 Tariff tables for indigenous tree species in the Southern Cape Province. **Forestry in South Africa 17**:29-36
Local volume tables with DBH as independent variable, were prepared for 6 groups of indigenous species for the Southern Cape Province. The increase in coefficient of determination, associated with the introduction of branch-free stem length as second independent variable is negligible. Branch-free stem length and bark thickness were regressed on DBH. Analyses of covariance indicated significant differences amongst slopes. Differences between slopes and levels of the volume curves should be primarily explained from differences in clear stem length and bark thickness and could not be ascribed to taper.
BIOMASS, INVENTORY, METHODOLOGY, TIMBER

458
Van Laar, A. & Lewark, S. 1973 Sampling for forest inventories in the indigenous forests of the Southern Cape Province. **Forestry in South Africa 14**:35-43
A sampling experiment was conducted in the Groenkop State Forest in the Southern Cape. The diameters of all trees from 100 mm DBH were measured on 0,02 ha square sampling units in a population with size 24,5 ha. A sampling intensity of 10% gives a maximum error of 7,2% of the mean, for a risk level of 0,05. Due to kurtosis of the distribution, however, the actual risk level is slightly below the calculated level. By combining adjoining sampling units into units with an area of 0,04 ha, the variance of the basal area distribution is halved. The diameter distribution is approximated by an exponential function. A sampling intensity of about 10% is adequate to estimate the basal area per ha, but a complete inventory is necessary for the estimation of basal area growth.
BIOMASS, DEMOGRAPHY, GROWTH, INVENTORY, METHODOLOGY, TIMBER

459
Van Steenis, C.G.G.J. 1978 Notes on a saprophytic orchid genus new to South Africa. **Bothalia 12**:451-452
This note focussed attention on the tiny saprophytes in everwet, primary forest. Their perennial underground parts consist of an often tuberous or coralloid rhizome living in symbiosis with ecto-mycorrhiza feeding on the forest humus. Reference is also made to the ecological similarity of the coastal old dune forests at Mtunzini, Natal, to the hill forests of the Malesian tropics.
DUNE, INTERACTION, SOIL, VEGETATION TYPE

460
Van Steenis, C.G.G.J. 1978 Gregarious flowering in the monocarpus

Genus Isoglossa (Acanthaceae). **Bothalia 12**:553
The gregarious occurrence of an Acanthaceous plant is noted to encourage observation of its gregarious flowering. It is another parallel between the coastal, old dune Natal and the Malesian hill forests.
AUTECOLOGY, DUNE, PHENOLOGY, REPRODUCTIVE BIOLOGY, VEGETATION STRUCTURE

461
Van Vuuren, D.R.J. 1961 (An ecological study of a northfacing and a southfacing ravine in the Magaliesberg.) **'n Ekologiese studie van 'n noordelike en suidelike kloof van die Magaliesberge.** Unpublished MSc thesis, University of Pretoria, Pretoria.
COMMUNITY, ENVIRONMENT, KLOOF, VEGETATION TYPE

462
Van Vuuren, D.R.J. & Van der Schijff, H.P. 1970 (A comparative ecological study of the vegetation of a north- and a south-facing ravine in the Magaliesberg.) 'n Vergelykende ekologiese studie van die plantegroei van 'n noordelike en suidelike kloof van die Magaliesberg. **Tydskrif vir die Natuurwetenskappe 10**:16-75
COMMUNITY, ENVIRONMENT, KLOOF, VEGETATION TYPE

463
Van Wyk, B.E. 1982 Keur (Virgilia oroboides): a feasible indigenous hardwood for the South African Forestry Industry. **South African Forestry Journal 122**:49-51
Economic, ecological and silvicultural arguments are presented, indicating that the use of Virgilia oroboides for timber production is a definite possibility. Large areas in the Southern Cape and Tsitsikamma regions are ideally suited for this indigenous species, yet only exotics are presently being planted for commercial timber production.
FORESTRY, PROPAGATION, TIMBER, UTILISATION

464
Van Wyk, B.E. 1982 Virgilia (Keur): Some preliminary results of species and provenance differences in establishment and early growth. **South African Forestry Journal 123**:24-28
A provenance trial of 18 geographically representative seed collections of Virgilia was planted at Stellenbosch in 1981. Survival and height were assessed one year after planting. The results indicate significant differences in survival between V. oroboides (Berg) Salter and V. divaricata Adamson, the latter being the hardier of the two. Survival and growth were generally poor although some trees had already reached a height of 1,5 m. No significant differences in height growth were found between the species and/or among the provenances of either species.
GROWTH, PHYTOGEOGRAPHY, PROPAGATION, TAXONOMY

465
Van Zinderen-Bakker, E.M. (Jnr) 1971 **Ecological investigations on ravine forests of the eastern Orange Free State.** Unpublished MSc thesis, University of Orange Free State, Bloemfontein.
COMMUNITY, KLOOF, VEGETATION TYPE, WATER RELATIONS

466
Van Zinderen-Bakker, E.M. (Jnr) 1973 Ecological investigations of forest communities in the eastern Orange Free State and the adjacent Natal Drakensberg. **Vegetatio 28**:299-334
COMMUNITY, KLOOF, VEGETATION TYPE

467
Van Zinderen-Bakker, E.M. (Snr) 1967 Upper Pleistocene and holocene stratigraphy and ecology on the basis of vegetation changes in sub-saharan Africa. In: Bishop, W.W. & Clark J.D. (eds.) **Background to evolution in Africa.** University of Chicago Press, Chicago. 923 pp.
CLIMATE, PALAEOECOLOGY, PHYTOGEOGRAPHY, VEGETATION CHANGE

468
Van Zinderen-Bakker, E.M. (Snr) 1976 Late Quaternary environmental changes in southern Africa. **Annals of the South African Museum 71**:141-152
During the Quaternary glaciations world-wide lowering in temperature caused northward shifts of the climatic belts in the southern hemisphere. As a consequence of these shifts southern Africa was much more exposed to the zone of the Westerlies with their strong winds, the invasion of many depressions, regular influxes of cold polar air and much more rain than present. The drastic changes which occurred in the major ecological regions during the last glacial cycle are discussed. The drop in temperature of 5,5-9,0°C could have lowered the upper limit of the vegetation on the Eastern Escarpment by some 1 000 m - this would have driven the trees and ravine forests away from altitudes above 1 100-1 200 m. The Cape coastal region received the full impact of the strong winds, and influxes of polar air and heavy rain were not limited to winter. During full glacial times the coastal plain was mainly covered by grassland. Evergreen forest could spread widely only during protocratic (rising, oscillating temperatures) and telocratic (declining temperatures) times when temperature and humidity reached medium values - conditions which prevailed at the beginning and end of the Holocene thermal optimum. During the optimum the climate was too dry for evergreen forest, and Karoo-like vegetation and dunes spread along the coastal plain. Macchia and Podocarpus forest, not sensitive to frost, would have been dominant during protocratic and telocratic times respectively before conditions were favourable for the coastal evergreen forest. These considerable changes in climate and vegetation may not have been of the same nature in the entire extended coastal

region.
CLIMATE, ENVIRONMENT, PALAEOECOLOGY, VEGETATION CHANGE

469
Vasselot, De Regne Compte 1882 The Cape forests. **Indian Forester 8**:1-25, 134-153, 246-262
DISTRIBUTION, SPECIES LIST, VEGETATION TYPE

470
Venter, H.J.T. 1972 (The plant ecology of Richards Bay, Natal.) **Die plantekologie van Richardsbaai, Natal.** Unpublished DSc thesis, University of Pretoria, Pretoria.
COMMUNITY, DUNE, FLORA, ENVIRONMENT, PHYTOSOCIOLOGY, SPECIES LIST, VEGETATION TYPE

471
Venter, H.J.T. 1976 An ecological study of the dune forest at Mapelana, Cape St. Lucia, Zululand. **Journal of South African Botany 42**:211-230
A quantitative account of the composition of the Dune forest is given. Two distinct communities, a sea-facing foredune and an inland-facing hinddune community were found. A checklist is provided of the plant species collected. The prevailing environmental conditions and their influence on the vegetation are briefly discussed.
COMMUNITY, DUNE, ENVIRONMENT, PHYTOSOCIOLOGY, SPECIES LIST, VEGETATION TYPE

472
Viljoen, S. 1977 Tree squirrels. **African Wildlife 31**(6):36-40
MAMMAL

473
Viljoen, S. 1983 Feeding habits and comparative feeding rates of three southern African arboreal squirrels. **South African Journal of Zoology 18**:378-387
Food utilisation by three arboreal squirrels was studied with regard to feeding habits and efficiency, food preferency and chemical analyses of the food. Food selected in the field by the two forest subspecies, the Ngoye red squirrel Paraxerus palliatus ornatus and the Tonga red squirrel P. p. tongensis are listed. Measurements of lengths of the different parts of their intestinal tracts indicate that the southern African arboreal squirrels are more insectivorous than tropical African squirrels. With regard to feeding efficiency, the tree squirrel P. cepapi cepapi, a savanna species, is relatively more adept at handling small seeds and the flesh of fruits, whereas the two forest subspecies mainly concentrate on the endosperm of large fruits. Chemical analyses of fruits and seeds indicate that the fat content is noticeably higher in fruits and endosperm from forests and that the protein content of savanna endosperm is higher than

from the forest.
BEHAVIOUR, DISPERSAL, FRUIT, MAMMAL, NUTRIENTS

474
Vincent, F.D.A. 1883 Timber trees at the Cape. **Indian Forester 9**:24-25
TIMBER, UTILISATION

475
Von Breitenbach, F. 1971 Notes on the Southern Cape indigenous forests. **Trees in South Africa 23**:30-40
A short description is given of the distribution, phytogeography and general ecology of the forests.
DISTRIBUTION, FLORA, PHYTOGEOGRAPHY

476
Von Breitenbach, F. 1972 Indigenous forests of the Southern Cape. **Journal of the Botanical Society of South Africa 58**:17-47
SPECIES LIST

477
Von Breitenbach, F. 1973 Indigenous forest of the Southern Cape: history. **Looking Back 13**:37-42
HISTORY, UTILISATION

478
Von Breitenbach, F. 1974 **Southern Cape forests and trees.** Government Printer, Pretoria. 328 pp.
The book consists of three sections: The Forests, Plants and Animals, and the Trees. The origin of the coastal forests is discussed in the first part. The composition of the forests and the wide variety of types which reflect the ecological differences occurring in the region are briefly described. The background of the scientific management of indigenous forests is presented in a clear and interesting way. A leaf key provides for rapid identification of the hundred most important forest trees. Descriptions and diagrammatic line drawings of the leaves are included.
DISTRIBUTION, FAUNA, FLORA, IDENTIFICATION AID, MANAGEMENT, SPECIES LIST, VEGETATION TYPE

479
Von Breitenbach, F. & Von Breitenbach, J. 1983 Notes on the natural forests of Transkei. **Journal of Dendrology 3**:17-53
History, present area and classification of the natural forests of Transkei are briefly described. The distribution of 232 tree and tall shrub species encountered in 27 mountain forests is presented in tabulated form. Composition, structure and type variations of the forests are discussed. Observations on the geographical distribution, autecology and synecology of several species are recorded.

CONSERVATION, DISTRIBUTION, HISTORY, SPECIES LIST, VEGETATION STRUCTURE, VEGETATION TYPE

480
Von Christen, H.C. 1964 Some observations on the forest soils of South Africa. **Forestry in South Africa 5**:1-21
The climate of South African forestry regions is briefly described. The influence of the climate on soil genesis is discussed with particular reference to the effect of leaching rainfall on ferralisation and podzolisation. The important morphological, chemical and physical soil properties of the three principal forest soil types are given, i.e. red and yellow ferrallites and the podzolic sandy soils of the Zululand coastal belt and of the constant rainfall area. Many veld and fynbos soils are considered to be degraded forest soils. The possiblity of their natural amelioration is suggested.
CLIMATE, HYDROLOGY, SOIL

481
Von dem Bussche, G.H. 1974 Conservation management of the indigenous forest in the Southern Cape Forest Region. **South African Journal of Science 70**:49-50
The conservation policy of multiple use management is briefly discussed. Objectives or functions of management are production of high-grade timber from medium-moist to moist high forest types, protection of forest substance for indirect uses, reconstruction of forest on abandoned plantation areas, elimination of alien vegetation, recreation usage and research. The policy for production and reconstruction management classes is described in more detail.
CONSERVATION, FORESTRY, MANAGEMENT, RECREATION, REGENERATION, TIMBER, UTILISATION

482
Von dem Bussche, G.H. 1975 Indigenous forest conservation management. **South African Forestry Journal 93**:25-31
The management policy and techniques applied by the Department of Forestry since 1967 in the indigenous forests in the Southern Cape Forest Region are discussed. The present system of multiple-use management, based on research by Phillips and Laughton was developed and applied by Von Breitenbach. Possible future developments are indicated.
CONSERVATION, HISTORY,MANAGEMENT, RECREATION, REGENERATION, TIMBER, UTILISATION

483
Von Gadow, K. 1973 Observations on the utilization of indigenous trees by the Knysna elephants. **Forestry in South Africa 14**:13-17
An indication is given of the preference for tree species and diameters of trees which elephants (Loxodonta africana) utilize in the Knysna indigenous forests. The average damage in terms

of volume and number of stems per adult elephant is estimated. Selective destruction of Ilex mitis and Zanthoxylum davyii was noted.
BEHAVIOUR, HERBIVORY, INTERACTION, MAMMAL

484
Von Gadow, K. 1977 **100 indigenous trees of the Eastern Cape Border Region: a leaf key.** Pamphlet 195, Department of Forestry, Pretoria.
A key based on leaf characters is augmented with line drawings and a brief habitat description for each species.
IDENTIFICATION AID

485
Von Gadow, K. 1978 A pellet count of blue duiker and bushbuck in the Knysna forests. **South African Forestry Journal 107**:77-81
Some results of a pellet count undertaken during 1970 in the Knysna indigenous forests are presented. There are indications that the method of counting faecal pellets could be developed as a practical and economical instrument for game census in dense forests. The study covered four aspects: mapping, defecation areas, study of weathering and disintegration of faeces, determining defecation rates, and counting the droppings of blue duiker and bushbuck in all forest sample plots.
DENSITY, DISTRIBUTION, INVENTORY, MAMMAL, METHODOLOGY

486
Vorster, P.J. 1970 **A floristic ecological survey of the Bryophyta of Mariepskop.** Unpublished MSc thesis, University of Pretoria, Pretoria.
FLORA, HABITAT, MOSS

487
Wager, V.A. 1950 The large forest tree-frog. **African Wildlife 4**:249-251
AMPHIBIAN

488
Walton, J. 1925 On South African fossil woods. **Annals of the South African Museum 22**:1-26
FOSSIL, PALAEOECOLOGY

489
Ward, C.J. 1980 The plant ecology of the Isipingo beach area, Natal, South Africa. **Memoirs of the Botanical Survey of South Africa 45.**
COMMUNITY, DUNE, PHYTOSOCIOLOGY, SPECIES LIST, VEGETATION TYPE

490
Watt, W.E. 1947 The conservation of existing forests and the need to plant forest trees for effective soil conservation

in the Union of South Africa. **Journal of the South African Forestry Association 15**:8-10
CONSERVATION, MANAGEMENT, SOIL, VEGETATION TYPE

491
Weisser, P.J. 1978 Changes in area of grasslands on the dunes between Richards Bay and the Mfolozi river, 1937 to 1974. **Proceedings of the Grassland Society of South Africa 13**:95-97
Changes in grasslands on the dunes (diminishing) are attributed to measures adopted against fire, woodcutting, grazing and shifting cultivation. Grasslands are a phase in the primary succession to Coastal Dune forest on the coastal dunes of Zululand. Due to the favourable climate the succession quickly proceeds from grassland to dune scrub and forest. In general the Coastal Dune forest in the area 28°24'S to 28°47'S and 32°06'E to 32°26'E, of 8 300 ha, with pronounced relief, 1 292 mm annual rainfall and humid, hot climate and sandy soils, has increased at the expense of grassland.
DUNE, ENVIRONMENT, FIRE, GRASSLAND, LAND USE, MANAGEMENT, SUCCESSION, UTILISATION, VEGETATION CHANGE, VEGETATION TYPE

492
Weisser, P.J. 1978 Conservation priorities in the dune area between Richards Bay and Mfolozi Mouth based on a vegetation survey. **Natal Town and Regional Planning Report 38**, Pietermaritzburg. 64 pp.
The report contains vegetation maps and the description of the vegetation units employed in the mapping of the dune areas between the Mfolozi River and Richards Bay. The study area extends along the coast for 60 km covering the coastal dunes. The dunes vary in width from a few hundred metres to a few kilometers. The area is covered partly with dense forest and thickets and has pronounced relief. The area has a warm to hot and humid subtropical climate. Rainfall varies from 760 mm in the northern interior to 1 250 mm on parts of the coast and against mountains, occurring mostly in summer (October-March) with peaks during February-March. Temperatures: maximum 28°C in January, 22°C in July. Minimum: 19°C in January, 9°C in July. Gales are infrequent. Mapping units representing forest vegetation are the following: (1) Seaward, Coastal thicket and Low forest (3,4%): woody vegetation of the first high dune front, exposed to sea winds, resulting in dense and stunted vegetation, 0,5 m to 5 m in height, total canopy cover 60-100%; (2) Coastal Dune Medium forest (16,4%): the climax forest on dune slopes and ridges, with little human interference. Height/cover values: canopy trees 3-18 m/10-80%, understorey 1-3 m/10-60%; field layer 0-2 m/5-90%; (3) Coastal Dune High forest (4,3%): in dune valleys between high dune ridges characterized by a mosaic structure given by the presence of emergent, tall trees (10-20 m) and areas densely covered with climbers (where overmature trees have fallen over) - a cyclical climax; (4) Swamp forest (0,15%); (5) Swamp forest - Ficus sycomorous forest complex (0,61%); (6) Hygrophilous forest (0,42%): gently sloping drainage valleys on wet, often water-logged (10-20 m/50% for trees, sub-canopy

trees and shrubs 1-3 m/30%, field layer 0-1 m/10%, tall herbs 1-2 m/70%; (7) Secondary dune forest (5,63%): advanced successional stages in the direction of a coastal dune forest after cessation or decrease of human interference (canopy trees 4-17 m/60-90%, understorey 0,5-4 m/20-60%, field layer 0-1,5 m/10-80%).
CONSERVATION, DUNE, MANAGEMENT, MAP, SUCCESSION, VEGETATION CHANGE, VEGETATION STRUCTURE, VEGETATION TYPE

493
Weisser, P.J. 1980 The dune forest of Maputaland. In Bruton, M.N. & Cooper, K.H. (eds.) **Studies on the ecology of Maputaland.** Rhodes University, Grahamstown, and Wildlife Society, Durban. p.78-90
The structure, species composition, age, origin and standing biomass of the five main types of woody communities on the dunes are described. These are: Primary types: Coastal thicket and Dune forest; Secondary types: Acacia karroo woodland, Secondary Dune forest and Secondary Dune scrub. The distribution and interrelationships of these types are described. Their conservation status is briefly discussed.
BIOMASS, COMMUNITY, CONSERVATION, DUNE, SPECIES LIST, SUCCESSION, VEGETATION STRUCTURE

494
Weisser, P.J. & Drews, B.K. 1980 List of vascular plants of the forested dunes of Maputaland. In: Bruton, M.N. & Cooper, K.H. (eds.) **Studies on the ecology of Maputaland.** Rhodes University, Grahamstown, and Wildlife Society, Durban. p.91-101
The list provides data from various published and unpublished reports and field data.
DUNE, FLORA, SPECIES LIST

495
Weisser, P.J., Garland, I.F. & Drews, B.K. 1982 Dune advancement 1937-1977 at the Mlalozi Nature Reserve, Mtunzini, Natal, South Africa, and a preliminary vegetation-succession chronology. **Bothalia 14:**127-130
Foredune advancement on a 2 km coastline north of the Sibaya Lagoon Mouth was studied using aerial photographs. Between 1937 and 1977 the dunes advanced about 95 m (2,4 m per year). Vegetation was dated according to its position on a profile. If a 2,4 m per year seaward advancement of the dunes is assumed, the following succession chronology is obtained. Scaevola thunbergii Foredunes from 0 to 30 years, Passerina rigida Open Dune scrub 30 to 60 years; Closed Dune scrub 60 to 90 years and Dune forest beginning at about 90 years. Variation in dune advancement rates on different coastal stretches and for different time intervals was observed and will be reported on later. This dune succession chronology should, therefore, only be seen as a first rough approximation.
DUNE, HISTORY, METHODOLOGY, SUCCESSION, VEGETATION CHANGE

496
Weisser, P.J. & Marques, F. 1979 Gross vegetation changes in the dune area between Richards Bay and the Mfolozi River, 1937-1974. **Bothalia 12**:711-721
Changes were mainly due to secondary successions, e.g. from grassland to Acacia karroo woodland and further to secondary dune forest - resulting from protection by Department of Forestry, which is also responsible for extensive afforestation. It is estimated that under the existing favourable climatic conditions it takes some dune grassland only 25-60 years to develop to mature A. karroo woodland and a further 30 to 150 years to proceed to secondary dune forest.
DUNE, FORESTRY, GRASSLAND, MANAGEMENT, SUCCESSION, VEGETATION CHANGE, VEGETATION TYPE

497
Weisser, P.J. & Muller, R. 1983 Dune vegetation dynamics from 1937 to 1976 in the Mlalazi-Richards Bay area of Natal, South Africa. **Bothalia 14**:661-667
Dune vegetation changes were studied quantitatively with the aid of aerial photographs taken in 1937, 1957 and 1976. Results were transferred to 1:10 000 scale maps. In 1937 roughly 80% of the dune forest habitat was occupied by planted fields and post cultivation seral stages such as secondary grasslands and dwarf shrubland, secondary scrub and Acacia karroo woodland. In three areas, the vegetation cover had been completely destroyed and drift sands had formed. In the 1950's the trend of vegetation degradation was changed by the implementation of an afforestation programme by the Department of Forestry. The 1976 aerial photographs indicate that the post cultivation seral stages of 1937 had been largely replaced by forest plantations. In secondary, unafforested areas the vegetation is evolving rapidly towards a secondary dune forest.
CONSERVATION, DUNE, FORESTRY, GRASSLAND, HISTORY, LAND USE, MANAGEMENT, METHODOLOGY, SUCCESSION, VEGETATION CHANGE, VEGETATION TYPE

498
Weisser, P.J. & Ward, C.J. 1982 Destruction of the Phoenix/Hibiscus and Barringtonia racemosa communities at Richards Bay, Natal, South Africa. **Bothalia 14**:123-125
The destruction of the Phoenix/Hibiscus and Barringtonia racemosa communities described by Venter (1972) on the southern shores of Richards Bay is reported. The cause was the artificial opening of a new mouth about 5,5 km south of the original mouth, which increased tidal range and salinity. These swamp communities occupied a narrow band about 6 ha in area behind the Bruguiera gymnorrhizae community. An estimated 95% of the communities was affected and only on the landward border were some isolated remnants of species such as Acrostichum aureum, Hibiscus tiliaceus and Phoenix reclinata detected. Young stands of Phragmites

australis, seedlings of Bruguiera gymnorrhiza and Avicennia marina and epipelic algae are recolonizing the affected area.
COMMUNITY, CONSERVATION, DISTURBANCE, MANAGEMENT, SUCCESSION, SWAMP, VEGETATION CHANGE

499
Wells, M.J. 1973 The effect of the wagon building industry on the Amatola forests. **Bothalia 11**:153-157
Selective timber cropping has made the recognition of primary plant communities in the forests extremely difficult. The side effects of the extraction of selected tree species from the forests were studied to reconstruct the effects of the cropping. Most of the timber trees cut were those species used for building, mine props and railway sleepers. An assessment of the other timber species selectively removed was only possible through a study of the wagon building industry. The wagon parts and timbers used in their manufacture are briefly described.
HISTORY, TIMBER, UTILISATION

500
Werger, M.J.A., Kruger, F.J. & Taylor, H.C. 1972 A phytosociological study of the Cape Fynbos and other vegetation at Jonkershoek, Stellenbosch. **Bothalia 10**:599-614
It includes the Brabeium, Rapanea and Heeria communities. The Braun-Blanquet phytosociological method was tested in the complex fynbos vegetation of the southwestern Cape Region. In the Swartboschkloof Nature Reserve, Jonkershoek, the fynbos, riverine scrub and forest vegetation was classified preliminarily into eight communities, which are described floristically and related to habitat.
COMMUNITY, FYNBOS, PHYTOSOCIOLOGY, SPECIES LIST

501
West, O. 1951 The vegetation of Weenen County, Natal. **Memoirs of the Botanical Survey of South Africa 23**:1-183
COMMUNITY, FLORA, SPECIES LIST, VEGETATION TYPE

502
Westfall, R.H. 1981 **The plant ecology of the farm Groothoek, Thabazimbi district.** Unpublished MSc thesis, University of Pretoria, Pretoria.
COMMUNITY, PHYTOSOCIOLOGY, SPECIES LIST, VEGETATION TYPE

503
Westfall, R.H., Everson, C.G. & Everson, T.M. 1983 The vegetation of the protected plots at Thabamhlope Research Station. **South African Journal of Botany 2**:15-25
Plots at Thabamhlope Research Station represent vegetation which has been protected from grazing and fire for periods of up to forty years. The original grassland of the Thabamhlope Plateau has progressed towards forest containing Podocarpus latifolius.

The kloof has now become self-protecting from fire.
DISTURBANCE, FIRE, GRASSLAND, SUCCESSION, VEGETATION CHANGE

504
Whateley, A. & Porter, R.N. 1983 The woody vegetation communities of the Hluhluwe-Corridor-Umfolozi Game Reserve Complex. **Bothalia 14**:745-758
Land units for the 900 km^2 Reserve Complex in northeastern Natal were identified on aerial photographs. The physiognomy, dominants and description of the woody vegetation for each unit were identified during ground inspections and, where necessary, the point-centred quarter method was applied. Two forests, two riverine forests, ten woodland and two thicket communities were recognized. These communities are described according to their distribution, height and percentage frequency of the components in the different canopy strata.
COMMUNITY, FLORA, METHODOLOGY, VEGETATION STRUCTURE, VEGETATION TYPE

505
White, F. 1978 The Afromontane Region. In Werger, M.J.A.(ed.) **Biogeography and ecology of Southern Africa.** W. Junk, The Hague. p.463-513
The Afromontane flora on the summits and upper slopes of the African Mountains is regarded as different from surrounding "lowlands" and more complex in origin than that of any other African phytochorion. The achipelago-like Afromontane Region is divided into seven regional mountain systems: West African, Ethiopian, Kivu-Ruwenzori, Imatongs-Usambara, Uluguru-Mlanje, Chimanimani and Drakensberg. About 20% of the tree genera are endemic, all of which are monotypic or oligotypic. Despite the wide range of vegetation types, and the wide intervals between adjacent mountains and the enormous latitudinal and longitudinal extent of the region, its flora shows a remarkable continuity and uniformity. The majority of genera and species are widely distributed. The East African mountains have the richest and most diversified tree flora. Although the Drakensberg system is reltively poor in tree species, it has the highest percentage of local endemics. The irregular distributions and very wide disjunctions of many of the species are due to complicated historical rather than ecological causes, but are poorly understood. Throughout the Region the lowermost vegetation type is forest with lower down narrow transition zones connecting the Afromontane and lowland phytochoria. It is only in South Africa where latitude compensates for altitude and Afromontane forest descends almost to sea-level, that the relationships between the Afromontane flora and the Lowland flora are at all complex. Most satellite populations appear to be relictual and occupy specialized sites. Some satellite populations occur sporadically, but most form part of east-west extensions of the Afromontane Region which may represent migratory tracks. The Magaliesberg extension, the Limpopo escarpment extension and the Zambezi watershed extension are briefly described. Ecological and chorological transgressors occur and are prominent

in two or more major phytochoria and at least two major vegetation types. 18% of the Afromontane tree flora are transgressors. In the Cape region Afromontane vegetation, which is represented there only by forest, is no longer associated with the crests and summits of mountains, but is confined to the lower slopes.
DISTRIBUTION, ENVIRONMENT, MONTANE, PHYTOGEOGRAPHY, VEGETATION TYPE

506
White, F. 1983 **The vegetation of Africa:** A descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa. Natural Resources Research 20, UNESCO, Paris. 356 pp.
This memoir and map cover the whole of Africa, the large island of Madagascar and all ecologically important islands in the eastern South Atlantic and western Indian Oceans. The purpose of the map is to indicate in broad terms the manner in which the main features of the local vegetation of any particular area can be related to the main features of African vegetation as a whole. The classification of the vegetation is based solely on the plants themselves, sometimes supplemented by observable features of the environment. The 100 cartographic units shown on the map are described under the twenty regional phytochoria. The salient features of the vegetation were described by making use of one or more concrete examples. Forest vegetation in South Africa falls within the Afromontane Region, an archipelago-like centre of endemism, and the Tongaland-Pondoland regional mosaic.
CLIMATE, DISTRIBUTION, MAP, PHYTOGEOGRAPHY, VEGETATION STRUCTURE, VEGETATION TYPE

507
Wicht, C.L. 1940 (Afrikaans forest tree names.) Afrikaanse bosboomname. **Journal of the South African Forestry Association 5**:41-61
Interesting notes on the popular and botanical names of the trees, with some ecological notes.
IDENTIFICATION AID, TAXONOMY

508
Wicht, C.L. 1976 (Conservation Forestry in South Africa.) Bewaringsbosbou in Suid-Afrika. **South African Forestry Journal 96**:12-15.
The paper briefly describes the extent of forests on State Forest Land and the objectives of research currently undertaken as well as research within other biomes or resources.
CONSERVATION, DISTRIBUTION, MANAGEMENT

509
Wicht, C.L. & Banks, C.H. 1963 (The influence of controlled burning and afforestation on water yield of mountain catchments in the winter rainfall region.) Die invloed van beheerde brand en bebossing op die wateropbrengs van bergopvanggebiede in die winterreenstreek. **Tydskrif vir Aardrykskunde II**(2):23-29
FIRE, FORESTRY, HYDROLOGY, MANAGEMENT, MONTANE

510
Wicht, C.L. & Kruger, F.J. 1973 (The development of management of mountain veld in South Africa.) Die ontwikkeling van bergveldbestuur in Suid-Afrika. **South African Forestry Journal 86**:1-17
The development of vegetation management in the humid catchments of South Africa is described. This includes scattered forest remnants within fynbos and grassveld types.
FYNBOS, GRASSLAND, MANAGEMENT, MONTANE

511
Wicht, M.L. 1957 Our lost forest heritage. **African Wildlife 11**:8-15
CONSERVATION

512
Wicht, M. 1957 (Why do we plant so few yellowwood trees.) Waarom plant ons so min Geelhoutbome. **Lantern** 7:189-164
AUTECOLOGY, CONSERVATION, PROPAGATION

513
Wicht, M.L. 1958 Forest fringes our coastline. **African Wildlife 12**:240-245
DISTRIBUTION, ENVIRONMENT

514
Wicht, M.L. 1961 Our coastal forests - a picture of beauty. **Veldtrust Jul-Aug**: 24-25
CONSERVATION, DISTRIBUTION

515
Wicht, M.L. 1963 Where the great forest meets the vast ocean. **Veldtrust Jan-Feb**: 21-23, 27
DISTRIBUTION, ENVIRONMENT

516
Wicht, M.L. 1968 The Tsitzikamma Forest. **African Wildlife 22**:231-239
VEGETATION TYPE

517
Wilson, M. 1982 The re-establishment of yellowwood forest. **Veld and Flora 68**:111-112
The establishment of indigenous forest trees, especially Podocarpus falcatus and P. latifolius, under Acacia mearnsii, A. melanoxylon and pines is described for the Hogsback area, Eastern Cape. Figures are provided on rate of establishment and growth rate. The value of re-establishment of indigenous forest trees is discussed.
EXOTIC, GROWTH, PROPAGATION, REGENERATION

518
Winterbottom, J.M. 1968 Remarks on some forest avifaunas of southern Africa with special reference to the south western Cape. **Ostrich 39**:146-149
BIRD, DISTRIBUTION

519
Winterbottom, J.M. 1978 Birds. In : Werger M.J.A.(ed) **Biogeography and ecology of Southern Africa.** W. Junk, The Hague. p.949-979
BIRD, DISTRIBUTION, SPECIES LIST

A : KEYWORD INDEX

B : REGIONAL INDEX

C : PLACE NAME INDEX

D : TAXONOMIC INDEX

PLANTS

ANIMALS

TITLES IN THIS SERIES

76. *A South African perspective on conservation behaviour - a programme description. Compiled by A A Ferrar. December 1983. 34 pp.

77. Limnology and fisheries potential of Lake Le Roux. B R Allanson and P B N Jackson (editors). December 1983. 182 pp.

78. Limnology of Lake Midmar. C M Breen (editor). December 1983. 140 pp.

79. The limnology of the Touw River floodplain. B R Allanson and A K Whitfield. December 1983. 35 pp.

80. *SANCOR: Summary report on marine research 1983. SANCOR. February 1984. 52 pp.

81. South African Antarctic Earth Science Research Programme. SASCAR. February 1984. 53 pp.

82. *The SANCOR marine sedimentology programme January 1984-December 1988. I C Rust (editor). March 1984. 15 pp.

83. A description of major vegetation categories in and adjacent to the Fynbos biome. E J Moll, B M Campbell, R M Cowling, L Bossi, M L Jarman, C Boucher. March 1984. 29 pp.

84. Environmental research perspectives in South Africa. February 1984. 77 pp.

85. Invasive alien organisms in the terrestrial ecosystems of the Fynbos Biome, South Africa. I A W Macdonald and M L Jarman (editors). April 1984. 72 pp.

86. Terrestrial ecology in South Africa - project abstracts for 1982-1983. May 1984. 198 pp.

87. Conservation priorities in lowland fynbos. M L Jarman. May 1984.

88. A synthesis of plant phenology in the Fynbos Biome. Shirley M Pierce. December 1984. 57 pp.

89. Aquaculture in South Africa: A cooperative research programme. O Safriel and M N Bruton. June 1984. 79 pp.

90. Pipeline discharges of effluents to sea. D A Lord, F P Anderson and J K Basson (editors). October 1984. 108 pp.

91. Monitoring in South African Grasslands. M T Mentis. September 1984. 55 pp.

92. Conservation of threatened natural habitats. Anthony V Hall (editor). November 1984. 185 pp.

93. Limnological criteria for management of water quality in the Southern Hemisphere. R C Hart and B R Allanson (editors). December 1984. 181 pp.

94. Water quality criteria for the South African coastal zone. J A Luscher (editor). December 1984. 42 pp.

95. National Programme for Weather, Climate and Atmosphere Research Annual Report 1984/85. C W Louw (compiler). December 1984. 28 pp.

96. A guide to the literature on research in the grassland biome of South Africa. N M Tainton. December 1984. 77 pp.

97. South African Red Data Book - Birds. R K Brooke. December 1984. 213 pp.

98. Directory of southern African conservation areas. T Greyling and B J Huntley (editors). December 1984. 311 pp.

99. The effects of crude oil pollution on marine organisms. A C Brown. February 1985. 33 pp.

100. SANKON : Opsommingsverslag oor mariene navorsing 1984. SANKON. Februarie 1985. 53 pp.

101A Verslag van die Hoofprogram vir Navorsingsondersteuning. Februarie 1985. 30 pp.

101B Report of the Main Research Support Programme. February 1985. 30 pp.

102. National programme for remote sensing. Report: 1984. P J van der Westhuizen. February 1985. 50 pp.

103. Bibliography of marine biology in South Africa. A supplement to the 1980 edition. A C Brown. March 1978. 83 pp.

104. The plant communities of Swartboschkloof, Jonkershoek. D J McDonald. March 1985. 54 pp.

105. Simulation modelling of fynbos ecosystems: systems analysis and conceptual models. F J Kruger, P M Miller, J Miller and W C Oechel (editors) March 1985. 101 pp.

106. The Kuiseb environment: the development of a monitoring base line. B J Huntley (editor). March 1985. 138 pp.

107. Annotated bibliography of South African indigenous evergreen forest ecology. C J Geldenhuys. May 1985. 125 pp.

*Out of print.