



South African Red Data Book: Plants — Fynbos and Karoo Biomes

A V Hall and H A Veldhuis

A Report of the Committee for Nature Conservation Research
National Programme for Ecosystem Research

SOUTH AFRICAN NATIONAL SCIENTIFIC PROGRAMMES REPORT NUMBER

117

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

Typeset in 1985 by The Cape Times, Cape Town
Printed by The Rustica Press, Wynberg

ISBN 0 7988 3599 0

Authors' Address:

A V Hall and H A Veldhuis
Bolus Herbarium
University of Cape Town
RONDEBOSCH
7700

*Previously Cooperative Scientific Programmes

PREFACE

The area covered by this Report is the Cape Province south of the Orange River and westward from the 26-degree line of longitude which lies close to Port Elizabeth. The region incorporates the greater part of the fynbos and karoo biomes.

These biomes both have rich floras. In the south and south-west, the fynbos biome and its enclosures of other vegetation such as forest and karoid types contain some 8 579 species of vascular plants (Bond & Goldblatt 1984). By world standards this is a major concentration of species diversity. The fynbos biome's former natural vegetation (now widely replaced by the plants associated with land utilization) covered 4% of southern Africa (including Namibia) yet has as much as 45% of its species of vascular plants.

Many of the plants, particularly in the fynbos, naturally occur in small and localized populations. A drastic habitat change over a small area, such as the ploughing of a patch of veld, can lead to extinction of a species as happened recently with *Sorocephalus tenuifolius* (Proteaceae).

In 1974 a group based at the Bolus Herbarium at the University of Cape Town began a survey of threatened plants which has culminated in this report. The survey was based upon the extensive herbarium collections in the region and supported financially by the Committee for Nature Conservation Research of the National Programme for Ecosystem Research of the CSIR. The planning of the survey was guided by the Committee's Working Group on Rare and Endangered Plant Species. Most of the field work was done in the south-western Cape Province, which has the region's highest concentration of local endemics.

The survey region covers a wide range of habitats, from semi-desert to high rainfall zones. For example, in kloofs in the coastal mountains and on the forelands of the Knysna region, tall relict forests are found, in sharp contrast to the semi-desert shrublands and succulents of the Karoo less than a hundred kilometres inland. A wide range of ecological problems will need to be assessed in conserving the plants. Comparisons of related ecological features of threatened plants in fynbos habitats are now being made (S. Brown, pers. comm.).

Habitat changes in the region are responsible for many of the threats leading to extinction. One of the worst-threatened areas is the fertile foreland region of the south and south-western coasts, where the natural vegetation has been widely altered and replaced by human land uses, particularly agriculture and, more locally, urban development. Extensive stands of remnant fynbos have been invaded and widely replaced by introduced alien plants. Special plant habitats, such as marshes, have been replaced or severely changed by land uses such as water storage, drainage and cultivation. In the Karoo, widespread mis-use of the veld has favoured weedy plants, which have invaded vast areas. In the east, the karoid semi-desert shrubland has replaced valuable grassveld across a wide front.

This report is a part-sequel to *Threatened Plants of Southern Africa*, published in 1980 as a preliminary list of the species in each province and adjoining countries, and in 1 x 1 degree areas of latitude and longitude (Hall et al. 1980). The threatened plants data bank upon which that was based has undergone some further revision. In this report the species are listed in an alphabetical catalogue for greater ease of reference. Separate lists have been included for various biogeographical zones, to assist in the planning of research and conservation programmes.

ACKNOWLEDGEMENTS

The authors wish to acknowledge with the warmest gratitude the fine support from the many people who have helped in the production of this report. Persons who have assisted in gathering herbarium and field data include R.J. Anderson, N.C. Anthony, W.F. Barker, M. Bates, P.A. Bean, C. Boucher, C.J. Burgers, R. Burroughs, D. Clark, J. Clarke, A.O. Crook, L. Crook, R. Dahlgren, K. Damstra, G.R. Delpierre, E. Esterhuysen, P. Fairall, M.O.C. Fenton, A.K. Forrester, J. Froggatt, A.J. Gardiner, R.P. Glen, P. Goldblatt, R. Greener, A. Gubb, J. Hensley, W.P.U. Jackson, H.P. Linder, W. Lloyd, S. Manchip, G.M. Micklem, A.V. Milewski, W. Mudge, E.G.H. Oliver, C. Paterson-Jones, C. Peterson, J. Powis, L. Raitt, N. Romoff, J.P. Rourke, R. Schadle, S. Schadle, E.A.C.L.E. Schelpe, P.A. Shepherd, D. Snijman, B. Stewart, S. Tansley, H.C. Taylor, H. Tolken, G.M. van Niekerk, I.J.M. Williams, N. Wilson and M. Zilverentant.

We are especially grateful to the persons who have reviewed the material for this publication, particularly Mr. C.J. Burgers, Mr. J.H.J. Vlok, Mr. C. Hilton-Taylor, Mr. A.J. Lamb and Mr. P.J. Brown; and to those who gave editorial assistance at the CSIR Foundation for Research Development.

We warmly thank the curators of the following herbaria for providing information: BOL, GRA, KMG, NBG, PRÉ, RUH, SAM and STE. We gratefully acknowledge the assistance given to this study by the public authorities, private land owners and the managers of reserves, especially in providing access and facilities during field expeditions. Warmest gratitude is expressed to the Council for Scientific and Industrial Research for financing the work of the Threatened Plants Research Group, and to the University of Cape Town for providing facilities at the Bolus Herbarium.

ABSTRACT

A list is given of 1 808 rare, threatened and recently extinct plants in the fynbos and karoo biomes in the Cape Province of South Africa. The area covers the south-western and southern Cape, Namaqualand and the Karoo. Following the IUCN categories the area has 29 plants Extinct, 118 Endangered, 183 Vulnerable, 495 Critically Rare, 281 Indeterminate and 702 Uncertain. Local lists are given for the main biogeographic zones in the area. The extent and causes of the threatened plant problem are discussed and lines along which research and conservation action might follow are proposed. Data are provided on the populations and conservation priorities of about 250 species.

SAMEVATTING

Van die seldsame, bedreigde en onlangs uitgestorwe plante in die fynbos en karoo biomes in die Kaapprovinsie van Suid-Afrika word 1 808 gelys. Hierdie gebied dek die suid-westelike en suidelike Kaap, Naamakwaland, en die Karoo. Deur gebruik te maak van die IUCN-kategorieë is bepaal dat 29 plante Uitgestorwe, 118 In Gevaar, 183 Kwesbaar, 495 Kritiek Seldsaam, 281 Onbepaald en 702 Onseker is. Plaaslike lysse word vir die vernaamste biogeografiese sones in die gebied gegee. Die omvang en oorsake van die probleem van bedreigde plante word bespreek en moontlike riglyne vir navorsing en bewaring word voorgestel. Data oor die bevolkings en bewaringsprioriteite word vir ongeveer 250 spesies gegee.

TABLE OF CONTENTS

PREFACE	(iii)
ACKNOWLEDGEMENTS	(iv)
ABSTRACT / SAMEVATTING	(v)
INTRODUCTION	1
Definitions: terms and IUCN categories	1
Special cases in applying the IUCN categories	3
HOW MANY THREATENED PLANTS?	5
Accuracy of the data	5
Comparison of totals with other regions	6
Comparisons between biogeographic zones	7
CAUSES OF DECLINE	8
Natural pressures	8
Human-caused threats	9
Prospects for increases or decreases in threats	11
MOTIVATIONS FOR PREVENTING DECLINE	12
World Conservation Strategy	12
Motivations for conserving threatened plants	12
PRIORITIES FOR PREVENTING DECLINE	14
Research priorities	14
Species priorities	15
CHECKLIST OF CONSERVATION ACTIONS	17
Rescue and survival teams	17
Emergency actions	17
Combatting threats	17
Restoration of populations and habitats	19
Establishment of nature reserves	19
Monitoring	19
Public involvement	20
REFERENCES	21
APPENDICES	
1. Threatened, rare and extinct plants of the fynbos and karoo biomes	25
2. Threatened plants in biogeographical zones	103
3. Statistics and maps	147
TITLES IN THIS SERIES	159

INTRODUCTION

The problem of threatened plants in southern Africa was first tackled in 1974 with a preliminary survey covering the sub-continent up to the northern and eastern borders of Namibia, Botswana, Transvaal, Swaziland and Natal. The results of this were reported as lists of threatened species given for countries, provinces and each 1 x 1 degree area of latitude and longitude (Hall et al. 1980). The implications of this report were analyzed and its statistics were brought up to date in a later publication (Hall et al. 1984).

At a more local level, a report was published on the threatened plants of the Cape Peninsula (Hall & Ashton 1983). Patterns of threat to the plants were discussed. Methods were proposed for rescuing threatened plants and ensuring their long-term survival.

As a data source for conservationists and research groups in the south-western Cape Province, a Rare Plants Gazette was issued as a semi-confidential document describing the conservation needs and actions on the region's sixty most threatened plants (Hall 1982a, 1982b, 1982c, 1984a). The text is held as a data-bank in a word-processor where it can be regularly up-dated, printed and circulated.

Appendix 1 of this report consists of an alphabetical listing of threatened plants in the Cape Province south of the Orange River and westwards from 26° E. longitude, which passes close to Port Elizabeth. The lists include summaries of the results of detailed field studies of about 250 species made by survey groups in the south-western Cape Province since 1974. While the chief aim is to provide data for conservation programmes, this information could also be a useful starting-point for studies of the ecology and microevolution of small populations, a field well suited to the Cape because of the many excellent cases of natural rarity there.

To avoid unscrupulous use of the lists by illegal plant collectors, nearly all locality names and descriptions have been excluded, except for the co-ordinates of quarter-by-quarter degree areas. Omitting place names has degraded the value of this report but this is necessary in the interests of ensuring the survival of rare plants.

Appendix 2 of this report contains lists of the threatened species in each of a number of biogeographic zones in the region. This arrangement has greater significance for conservation management and scientific study than the grid system used previously (Hall et al. 1980). Appendix 3 gives maps of the zones and distribution statistics of species.

DEFINITIONS: TERMS AND IUCN CATEGORIES

Plants have non-uniform distributions, with areas of absence or low density lying between more dense occurrences. Where the patches are isolated from each other they are generally referred to as *populations*. Frequencies of both populations and individuals vary from abundant to rare. The factors which are likely to cause increased rarity and perhaps eventual disappearance of a plant are termed *threats*. Plants affected in this way are said to be *threatened*. Natural (and less often human-caused) factors causing declines are sometimes also termed *pressures*.

To the conservation biologist, rarity must be seen in context of time. Some plants such as the fern-ally *Lycopodium* may have been continually rare over long periods judging by its very widely scattered, small populations. This may be termed *static rarity*. A likely local example is *Erica fairii* (Ericaceae) which has a single population which has stayed the same small size since it was discovered about a hundred years ago.

Other species such as *Erica jasminiflora* seem to have become relatively rapidly rare and then extinct due to habitat destruction. In theory, some plants may be rare because they are still in a process of evolutionary radiation which may result in eventual abundance. Examples of rare plants becoming abundant are difficult to find: a possible case may be *Leucospermum parile* (Proteaceae) but habitat destruction may eventually curb its evident tendencies toward expansion. These are cases of *dynamic rarity* in which the plants are rare and either going extinct or becoming abundant, slowly or rapidly.

Because of the range of local conditions encountered by a species, its local changes of rarity or abundance are non-uniform. In cases such as *Witsenia maura* (Iridaceae), the changes of abundance in each of the dispersed populations is significant in estimating the overall status of the species. The extinction of component populations containing important locally adapted ecotypes may be overlooked in listings which record only on the status of the species as a whole.

The concepts of static and dynamic rarity are incorporated in the standard categories used in this report: these were developed by the International Union for the Conservation of Nature and Natural Resources (IUCN: Lucas & Synge 1978). Conservation planning requires much more information than rarity and rate of approach to extinction. This information, which includes the values of species and priorities for restoring populations is considered in the section on conserving threatened plants. Definitions of the IUCN categories are given below: they are identical in meaning to those used by the IUCN and in the threatened plant list for southern Africa, except for minor changes for extra clarity. The prime focus of the definitions is the *species*, but because occasionally the lower taxonomic categories of *sub-species* and *variety* contain important enough distinctions for their inclusion in lists of threatened plants, the wider term *taxon* (plural *taxa*) is used.

Extinct: Taxa which longer exist in the wild: not found in repeated searches of all known and likely areas. This category is also used for a taxon which no longer occurs in the wild but survives in at least some form in cultivation, probably so genetically impoverished or altered as to make it impossible to return it to a natural habitat.

Endangered: In immediate danger of extinction if the factors causing decline continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Vulnerable: Taxa believed likely to move into the Endangered category in the near future if the factors causing decline continue operating. Included here are taxa of which most or all of the populations are *decreasing* because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously *depleted* and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are *under threat* from serious adverse factors throughout their range.

Critically Rare: Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localized within restricted geographical areas or habitats or are thinly scattered over a more extensive range. The category is termed Critically Rare to distinguish it from the more generally used word 'rare'.

Indeterminate: Taxa temporarily grouped here are awaiting placing in one of the above categories when further information becomes available.

Uncertain: Taxa temporarily grouped here are those for which reasonably good but unconfirmed grounds exist for believing the plant to be in one of the above categories, as well as being taxonomically distinct.

Not Threatened: This is used for taxa which are no longer in one of the above categories due to an increase in population sizes or to subsequent discoveries of more individuals or populations. There are no cases of this category in the present report. Unlike a previous report (Hall et al. 1980) there are no cases in which the plant is threatened within the region under study but Not Threatened elsewhere.

SPECIAL CASES IN APPLYING THE IUCN CATEGORIES

Cultivation: The lay public frequently believe that by taking a wild plant into cultivation it will become secure against extinction. However, there are risks in cultivation which are so serious that only long-established cultivated species such as the Maidenhair tree (*Ginkgo biloba*: Ginkgoaceae) can today be regarded as in the Not Threatened category. This is the reason why the IUCN category Extinct may be applied to plants lost in the wild but still in cultivation.

The reason for this is that plants recently brought into cultivation are not regarded by conservation biologists as the generally effective survival populations of a species.

At a practical level, horticultural fashions may change to disfavour the plant, so it may gradually vanish. The plant may be so unattractive as to be unwelcome as a subject for cultivation. The general solution is to try to return it to its former natural habitat. Very little experience exists of returning plants to natural habitats in South Africa: horticulturists are primarily concerned with working in controlled environments in gardens.

At a theoretical level, returning a species to the wild after many generations of cultivation is in most cases unlikely to be successful. This is due to exposure to specialized selective forces in cultivation. These forces are in theory so unfamiliar to the plant that significant elements in its original natural gene-pool may be changed in frequency or lost altogether (Hall and Rycroft 1979).

There are several points in the plant's life-history where cultivation may impose unfamiliar selective forces. Seedlings may be raised in the quite unaccustomed habitat of a seed-tray where they are watered and fertilized to an extent that only the phenotypes that can tolerate this survive. Runts may be removed to 'improve' horticultural quality. Such runts may be the only plants carrying chromosome-linked alleles for disease-resistance or some other special habitat tolerance held in the individual's 'evolutionary memory' (Harper 1977) from a previous natural catastrophe which it survived. Garden populations are often small, accentuating the possibility of genetic drift or rapid leakage of allelic diversity by inbreeding and consequent fixation to a homozygous state. Hybridization may occasionally be another hazard.

This is not to say that the use of cultivation has no value: it certainly can be of outstanding importance as a temporary, few-generation bridge between a relict population, nearly extinct, to one that has been made safe by removal of human impacts and restored to its former natural size by the addition of many more individuals. Cultivation may be more satisfactory in the longer term for long-generation species which may be less subject to genetic drift. Such a case is *Ginkgo biloba* L., which is unknown in the wild but survived as a temple tree in Northern China. As a tree up to 30 metres height, it was well-placed to survive as small relicts in cultivation: its generation-time is so long that any rate of decline due to inbreeding would be much slower than, for example, an annual herb.

In contrast, the prospects of re-establishing the handful of cultivated remnants of a species such as the small shrub *Erica verticillata* Berg. where it once grew in a now virtually destroyed habitat on the Cape Flats are poor indeed, as are its long-term prospects in horticulture, so the plant must be rated as effectively Extinct. Of course one hopes this prediction will prove wrong but the chances of its survival are clearly poor.

Seed stores, dormancy and rarity: Rarity at a site is usually judged by the number of plants or seedlings which can be found. This can be misleading. There may be large numbers of embryonic individuals lying in seeds in the soil or still encased in fruits on the plants. Seeds of some species may last many years in the soil, perhaps long after the plant may seem to have been locally extirpated. In some plant groups, many individuals may lie temporarily underground as perennating organs. In the case of Orchidaceae these may not sprout above-ground for up to a decade or more. Iridaceae such as *Gladiolus* and *Moraea* are often represented above-ground by a virtually unidentifiable leaf cluster growing from a deeply buried corm, perhaps flowering in only one or two years after the start of a lengthy fire regrowth cycle.

The main problem in applying a threatened status category in cases like this is to make a reliable census to find out how large the stock of seeds or underground organs actually is. Another aspect is to find out whether natural triggers exist as part of a normal cycle to create more adult plants. Both kinds of data are difficult to acquire. The problem is especially important in the fynbos and karoo biomes where many plants have long cycles of dormancy which are broken by either fire or rainfall events. The Marsh Rose (*Orothamnus zeyheri*: Proteaceae) which has major cyclical fluctuations in numbers of adults is a case in point. In later parts of the fire cycle the sizes of the plant populations may become critically small although the number of embryo plants in the seed store are apparently adequate for continued survival (Boucher 1981).

Critical transient threats: The problem here is to assess what the status of the population is, often with only the 'snapshot' view of a single expedition to its site. Transient threats may be missed altogether, such as the fire which in a particular strength and season has all but annihilated the plants and seed-store of *Leucadendron bonum* (Proteaceae) in a remote part of the Cedarberg. Transient threats are significant among all threatened species but may rapidly convert Critically Rare plants into the Endangered or even Extinct category.

HOW MANY THREATENED PLANTS?

Surveys to find out how many threatened plants there are in a region are based in the first place upon specimen records in herbaria. Herbaria contain an enormous amount of phytogeographical data. In the Cape they carry specimens and references to carefully recorded observations since the first professional botanist, Paul Hermann, arrived there over 300 years ago.

About half a million specimens are housed in the main herbaria of the south-western Cape, which are the Guthrie Herbarium for the Cape Peninsula and the Bolus Herbarium, both at the University of Cape Town; the Compton and South African Museum Herbaria at Kirstenbosch; the Botanical Research Unit, Directorate of Forestry and University Botany Department Herbaria at Stellenbosch, and the Herbarium of the University of the Western Cape at Bellville. Other main herbaria relating to the region are the National Herbarium in Pretoria, the Albany Museum and Rhodes University Herbaria at Grahamstown, the herbarium at Saasveld near Knysna, and the McGregor Memorial Museum Herbarium at Kimberley.

These herbaria were examined to find species which are rare or which occur in habitats known to be extensively changed. The resulting lists of species were reviewed and supplemented with information from taxonomic specialists and ecological sources. Selected species in the list were then checked in the field in order to discover all populations of each plant and to assess the nature and strength of the threats involved.

A dossier was made for each threatened species, consisting of a manilla wallet which holds maps, notes and a field card for identification of the plant. The card carries a description, photographs of specimens and a table of localities and flowering times. The species names, localities and flowering times were put into a computer data bank for the extraction of lists of the taxa which are in flower in a study area at some particular time of the year. This has been a valuable aid in planning expeditions (Hall 1981).

ACCURACY OF THE DATA

How accurate are the results of threatened plant surveys? This is the first question an administrator must ask before sinking public funds into costly conservation programmes. There are problems at every stage of a survey.

A prime problem is the accuracy of each group's taxonomy. An early monograph is sometimes all that is available in some poorly studied groups, such as the Poaceae in the Cape. Lacking representative material, the monographs often have species represented by a handful of specimens: later studies with more material may show that such species are in fact not as distinct as had been supposed and lie within the variation range of others. This places taxonomists in a central position in threatened plant studies, which is the main reason why the work is conveniently based at a herbarium. Fortunately, many of the groups which have many threatened plants have been intensively studied recently in the field: notable here is the work on the major fynbos families by I.J.M. Williams and J.P. Rourke (Proteaceae), E.G.H. Oliver (Ericaceae), E. Esterhuysen and H.P. Linder (Restionaceae) and P. Goldblatt (Iridaceae).

Another problem is whether herbaria have enough records for sending threatened plant surveyors to the right localities. This is called to question by the work of Gibbs Russell (1985) who is using the Precis data bank of the Botanical Research Institute, Pretoria, to inspect the densities of records in degree grid areas in South Africa: this study has found that some areas are very much better represented by specimens in herbaria than others. This problem is disquieting in areas which are known to be poorly explored. Most of the species recorded in this report are from well explored areas. Other regions may yield many more threatened taxa. In Appendix 1 attention is sometimes drawn to whether an area has been explored well or not, as a guide to the degree of confidence one should have in a species' assigned population status.

Once in the field the most difficult problem is often that the botanist is faced with finding the rarest plants in a landscape which is so much altered that only small relicts of natural vegetation are left. Great persistence must be exercised in the field to find the handful of individuals which are the last remainders of a nearly extinct population.

COMPARISON OF TOTALS WITH OTHER REGIONS

The total numbers of threatened plants in the IUCN categories in the fynbos and karoo biomes given in Table 1, together with the latest available for southern Africa as a whole (refer also to Appendix 3). It is seen that the fynbos and karoo biomes have 76% of the known threatened plants in the sub-continent.

Table 1. Threatened plants in the fynbos and the karoo biomes (1) compared with former statistics for all of Southern Africa (2: Hall et al. 1984)

	(1)	(2)
Recently Extinct	29	39
Endangered	118	110
Vulnerable	183	223
Critically Rare	495	700
Indeterminate	281	393
Uncertain	702	908
TOTALS:	1 808	2 373

These statistics make interesting comparisons with those from elsewhere in the world. A total for somewhat similar categories for the whole of Australia is 2 053 species (Good 1979). A high proportion (46%: 936) are in Western Australia, which like the Cape Province has much local endemism in its Mediterranean climate zone. New Zealand has an estimated 256 plants in these categories (Given 1979).

In another Mediterranean climate zone, the State of California has 680, or 32% of the 2 140 endangered, threatened and recently extinct plants of continental United States of America (Ayensu and DeFilipps 1978). This again resembles the relationship between the Western Cape and the rest of southern Africa.

The fynbos and karoo biomes' figures are considerably higher than those indicated by preliminary taxonomic and ecological surveys elsewhere in Africa. 257 Sudanese species have been listed as localized and endangered or likely to be so; Ghana has about 210 plants which are rare or threatened; Tanzania has 388 plants which are described as vulnerable or rare; and Zimbabwe has 18 plants Endangered, 26 Vulnerable and 40 Rare, making a total of 84 (Hedberg 1979).

In North Africa, the few more fertile and well watered countries have the larger shares of threatened plants, an expected result due to the natural impoverishment of the arid floras of much of the region. For example, Morocco has 19% of the region's estimated 1 229 rare, recently extinct and threatened plants.

The countries bordering the Mediterranean tend to have rather more threatened, rare and recently extinct plants than others in Europe: of a provisional total of 1 364, Greece has 34%, Spain 16% and Italy 10% (Lucas and Walters 1976). This could be accounted for by the more northerly and high altitude countries in Europe such as Sweden and Switzerland were largely 'wiped clean' of vascular plants by glaciation and severe peri-glacial climates in the Pleistocene Glacial Periods, the last of which had been in major retreat as recently as 10 000 years ago. It is interesting that the post-glacial pioneers and their successors seem to have evolved few localized neo-endemic species in this period.

This brief survey shows that the Western Cape Province's total of 1 808 plants in hazard is large by world standards. In particular, the figure given for part of the fynbos biome in Appendix 3, 1 326 rare, threatened or recently extinct plants, is considerably higher than that for other known temperate climatic areas in the world. This confirms a similar finding, made on less refined data, but for the entire fynbos biome (Hall 1983a).

COMPARISONS BETWEEN BIOGEOGRAPHIC ZONES

An inspection of Appendix 3 shows that about 73% of the threatened plants are concentrated in the fynbos biome which is about 21% of the survey area. It is important to note that the threatened plants in the karoo biome are rather less well known: nearly half the species are in the Uncertain category (probably threatened) compared with a third in the fynbos biome.

Each biome is subdivided into biogeographic zones which are illustrated in Appendix 3. They were based upon mapped vegetation data from Moll et al. (1984), Boucher (1983) and Hilton-Taylor (in prep.). Species / area ratios are provided for comparing known concentrations among the biogeographic zones.

The Cape Peninsula has by far the most critical concentration of threatened plants: this is not surprising as it has some 157 narrow endemics (Hall and Ashton 1983) and has experienced the impacts of urban and agricultural development for over 300 years.

In general the western mountain region has a marginally higher concentration of threatened and rare plants than either of the lowland areas, with the southern mountains following rather far behind. A feature of the lowlands is the high concentration found on mountain fynbos outliers. Elim Dwarf Fynbos and Renosterveld surprisingly do not figure highly: perhaps their vegetation was replaced by agriculture too far in advance of botanical collectors to make adequate records of the undoubtedly rich flora there.

The karoo biome generally has low concentrations of rare and threatened plants, probably more due to a lack of collecting than real absence. The Worcester Karoo zone is much better known than other parts and has the highest concentration recorded for the karoo biome. This zone has seen considerable changes in the natural vegetation from increasingly intensive land-uses.

CAUSES OF DECLINE

Natural decline and extinction has been an immensely important process shaping the world's biota, yet very little is known about it (Soulé 1983). Fossil evidence suggests that plant species have a natural life of 4-15 million years (Niklas et al. 1983). What makes a species become naturally extinct? Does it decline due to its weaker competition for resources against better adapted segregates? Is there a fatal loss of important elements of genetic diversity in critical population bottlenecks caused by environmental changes? How large a role does the evolution of predators and pathogens play?

One point does seem clear: natural and human factors causing decline operate on very different time scales. Natural repressive factors generally seem to cause long-term declines, apparently lengthy enough to match the rates of evolution of replacing species in the flora. In contrast, human-caused factors such as drastic habitat change appear and operate much more abruptly.

One of the most interesting areas to study the effects of natural and human-caused threats is the Cape Floristic Kingdom, the term used by plant geographers for the rich fynbos flora of the southern and south-western Cape. The Kingdom excludes enclosures of forest, succulent scrub and other unrelated vegetation types. It is confined to mountains and patchy coastal relicts from 250 km north of Cape Town to 800 km to the east. It covers only 0,04% of the world's vegetated surface and is one of only six sub-divisions at this high rank (Good 1964, Walter 1968, Takhtajan 1969). Destruction of natural populations has proceeded apace in the Kingdom, which, as noted in the comparisons made in the previous section, appears to have the highest concentration of rare, threatened and recently extinct plants of any known Temperate area in the world (Hall 1978).

The fynbos flora of the south-western Cape's coastal lowlands is particularly at risk from expansion of agriculture to meet the food demands of massive population increases. Without adequate conservation measures, the region could be heading for a major phase of extinction among its endemic plants. Recently, proposals have been made for a major strengthening of conservation in the lowlands, particularly for the setting aside of nature reserves (Hall 1984b).

Threats to species and ecosystems in the karoo biome, which surrounds the fynbos biome except in its eastern fringes, are more difficult to assess, but work is under way on this (C. Hilton-Taylor, pers. comm.). A serious problem, about which it is very difficult to get reliable information, is the threat of illegal collectors and exporters to the karoo biome's succulent flora, especially in Namaqualand.

NATURAL PRESSURES

Plant distributions in a landscape reflect the layout of habitats and the communities of organisms which have been in the region to colonize them. Habitats and organisms are both subject to change over vast time scales. Time, habitats and organisms are the three main components in considering those populations which are, in today's view, small due to natural pressures. It is important to emphasize the role of natural pressures: it is all too easy to ascribe the chief cause of the threatened plant problem to human impacts alone (J.P. Rourke, pers. comm.)

Natural populations show decline, stasis or increase over a period of time. The dynamics of such changes have been investigated in a limited number of species by authors such as Harper (1977, 1981) and Tamm (1972). In any flora, one may expect some populations to be rare as a result of having recently evolved (neo-endemic), or in a state of having been depleted by some natural factor such as pathogen attack. Such populations may be in a state of low density equilibrium with the pathogen (as often happens with biocontrol of weeds) or may be in decline.

The fynbos and karoo biomes have a high proportion of local endemics, many being superb examples of natural rarity. It is difficult to interpret what natural pressures are confining these plants to their small areas: they are good candidates for future autecological research.

Some species may be relicts of former more widespread populations. Examples are some of the high altitude *Bruniaceae* such as *Brunia macrocephala* Willd., confined to upland sites moistened by summer mists and with occasional winter snowfalls. Such plants may be palaeo-endemics, their distributions perhaps related to the cooler times of the Pleistocene.

HUMAN-CAUSED THREATS

The fynbos and karoo biomes have many locally endemic plants. These easily become threatened by extensive resource exploitation, particularly farming, which has intensified over vast areas in the region. Increased exploitation is associated with massive increases in human numbers. At present population growth is estimated to be close to seven million more people a month in the world and nearly sixty thousand monthly in South Africa (Salas 1981, Fuggle 1983). With the limited agricultural resources of southern Africa, such growth cannot continue indefinitely. Already acute distress is suffered by rural populations during periodic droughts where the resources of the countryside are dangerously exceeded by demand. Intensification of land uses must inevitably place human population growth on a collision course with rare species which stand in the way (Hall 1978).

It is unrealistic for conservation biologists to concern themselves only with the customary time scales of economists of at the most a decade or two into the future. The lag time in curbing human population growth is likely to be so great that time scales of 100 to 500 years into the future are much more relevant for conservation planning. Major cultural and economic adjustments are needed before human population growth will decline enough for effective conservation. Although much has been accomplished, curbing human population growth remains a problem which remains extremely difficult to resolve (Hanks 1984).

Computer analysis of Landsat tapes indicated that 34% of the natural vegetation of the fynbos biome has been removed by farming and other human activities (Moll and Bossi 1984). This study showed that in the most altered parts of the fynbos biome, losses in area of the vegetation types recognized by Acocks came to 85% for Coastal Renosterveld, 47% for coastal Macchia and 27% for Mountain Renosterveld. Only 11% was reported lost in Macchia: however, extensive impacts of over-frequent fires, grazing and alien plant infestations have penetrated this vegetation type.

It is helpful for conservation to analyze the kinds of threats which place plants at risk. Little has been published on this for the western Cape. Most studies are on threatened species (for example, Boucher 1981, Moll and Gubb 1981). In a recent report on the threatened plants of the Cape Peninsula, the most common threats were alien vegetation and construction of houses and factories (Hall & Ashton 1983).

In another study, the threats to plants in the Extinct, Endangered and Vulnerable categories were listed for the region from Somerset West to Elim. This is given in Table 2, with the most common threats placed first. The list contains several causal networks: for example, drainage of wetlands and soil erosion are often linked to agricultural and construction projects. Genetic decline was included to illustrate a particularly serious biological factor which has causal links to many other threats.

Table 2: Analysis of threats affecting 95 plants in the categories Extinct, Endangered and Vulnerable in the coastal plains and foothills from Somerset West to Elim and to the base of the Rivieronderend range, including the Kogelberg and Hottentot's Holland Mountains

REGIONAL THREATS: SOMERSET WEST TO ELIM	SPECIES AFFECTED	
	NUMBER	PERCENTAGE
Invasive alien plants especially Acacias, Hakeas, Pines	49	52
Agriculture	47	49
Presumed genetic decline in critically small populations	22	23
Construction of housing and factories	12	13
Uncontrolled veld fires	11	12
Flooding of valley bottoms by dams	9	9
Construction of roads, railways and harbours	8	8
Zonings for future construction	7	7
Commercial flower picking	5	5
Plantations of exotic trees	5	5
Quarries and gravel borrow pits	4	4
Trampling	4	4
Grazing and browsing	4	4
Illegal wildflower picking	3	3
Drainage of wetlands	2	2
Drift-sand suppression	2	2
Soil erosion	2	2
Pathogens such as <i>Phytophthora cinnamomi</i>	2	2
Development of sporting and recreational facilities	1	1
Rubbish dumping	1	1

These statistics indicate the priority problems to be tackled first in plant conservation in a sample of the south-western coastal region which has numerous plants in hazard. A brief account of the most common threats and anti-threat measures is given below.

Alien invasive plants: The most widespread threat to the survival of rare plants in the fynbos biome is invasion by alien plants. The most threatening invaders are the Australian Acacias. Extensive planting of Australian Acacias, especially as sand-binders along coastal areas has resulted in extensive invasions and changes to ecosystems inland (Walsh 1968; Stirton 1978). These plants have a massive seed output which in Australia is mostly destroyed by insects. In the Cape the seeds are seldom attacked by insects and the plants have as a result a massive reproductive ability (Milton & Hall 1981). Some of the seed appears to be capable of surviving over a hundred years in the soil, posing a long-term threat even in areas that have been cleared.

Systematic, integrated sets of controls that go beyond costly clearing operations are needed. The best foundation for this is to start with biological controls. The Plant Protection Research Institute at Stellenbosch has introduced a gall-forming wasp from Australia which is specifically adapted to attack the floral buds of *Acacia longifolia* (Andr.) Willd. Studies are being made of the indigenous Alydid bug which is attacking Rooikrans, *Acacia cyclops* A. Cunn. Port Jackson, *Acacia saligna* (Labill.) Wendl. is not yet being attacked. With its strong coppicing growth and high annual seed-fall of some 10 000 seeds per square metre below fully grown trees, it presents a formidable challenge to conservationists (Milton & Hall 1981).

Other seriously threatening exotics are *Hakea*, being controlled mainly by clearing by the Directorate of Forestry in catchments and by biocontrol by insects introduced by the Plant Protection Research Institute; *Leptospermum* from Australia; *Sesbania* from South America; and the Cluster Pine, *Pinus pinaster* Ait. from southern Europe.

Agriculture: The most extensive threat, especially in the fertile parts of the coastal lowlands, is agriculture. This vitally important land use, particularly for grain production, is one of the south-western Cape's major industries.

The growth of agriculture has not been adequately integrated with conservation needs in this floristically very rich region. This has been largely due to a lack of data. For example, prior to the CSIR-funded survey begun in 1974 little was known about the high concentration of rare and threatened plants in the lowlands. The few natural patches now left in the coastal grain belt are critically in need of protection against destruction by ploughing, as many contain valuable remnants of important species and ecosystems.

The Conservation of Agricultural Resources Act of 1983 requires that a permit be obtained before any previously unploughed area can be cultivated. This could be a vital means of halting destruction of threatened natural features in agricultural areas.

In the karoo biome, serious problems have arisen through over-stocking in the sensitive arid vegetation. In some parts of the multi-year climatic cycle, the grazing pressure may be easily met from semi-desert grass and shrublands, while at other times the plant life may be overgrazed so much as to need years to recover.

Genetic effects of isolation in small populations: Agricultural land uses often completely replace the natural vegetation with ruderal, crop and pasture species. Some remnants of natural vegetation may be left where such land uses are impractical. The effects of this isolation pose interesting genetic problems which could be useful targets for research. In theory, both positive and negative evolutionary effects may ensue.

Theory and supporting evidence suggests that if a group of plants or animals is in a state in which rapid evolution may take place, speciation can be stimulated by confinement in small populations (Wright 1943, Chesser 1983). In nature small populations are continually being formed which serve as isolated, exploratory experiments in gene-ecology, most of which fail for some or other of the reasons given below.

Small populations under threat from human disturbance are unlikely to survive long enough to undergo evolutionary change. Their habitats are all too often subject to abrupt and catastrophic pressures such as repressive invaders, soil erosion, increased fire frequency or predation. An intrinsic difficulty is that the changes which may occur may be largely influenced by genetic drift, a stochastic process which may rapidly bring the gene-pool into conflict with selective forces to such an extent that the population goes extinct. Theory shows that in a few generations in a small, isolated population of an outbreeding species, vital genetic variability may leak away, leaving the species unable to cope with unusual stresses in its habitat. This loss may also lower the chances of evolving new and better adapted strains. In animals, continual inbreeding in small populations often causes a depression of reproductive fitness which may be fatal in the long term: this may also apply to certain plants, particularly those which are normally outbreeders.

Considered overall, isolation and consequent genetic decline are potentially very dangerous for the long-term survival of small remnant populations of plants.

Building and engineering construction: Several of the threats listed in Table 2 are related to building and engineering construction. These activities have often taken place in areas of high natural diversity and endemism, such as at the coast, affecting considerable numbers of rare species.

Over-frequent, accidental or ill-timed veld-fires: These can be a particularly serious threat in vegetation which has a seed store of invasive alien plants, either in the soil (as in *Acacia*) or in unopened fruits (as in *Hakea*). The seeds germinate, producing a growth of exotics which out-compete the natural vegetation, transforming the local species' habitat. Different seasons of burn have been shown to stimulate or retard major groups of species such as *Proteas*. Maintaining a particular season of burn which is unsuited to *Proteas* over several fire cycles may eliminate them from the area altogether. This complex matter is being studied as part of the Fynbos Biome Programme of the National Programme for Ecosystem Research, particularly by the Directorate of Forestry.

PROSPECTS FOR INCREASES OR DECREASES IN THREATS

The most obvious prospect is an increase in the human population, particularly in and near the region's main urban centres. The Cape Town Metropolitan Region increased by 30% in the 1971-1980 census decade, the growth being partly drawn from immigration from the Platteland.

This growth, which is unlikely to be checked effectively within the next thirty years, will have far-reaching consequences in strengthening the factors which have been depleting and threatening plant habitats in peri-urban and country areas. Increased food demand will send ploughs onto steeper slopes to which technology has now adapted them. Grazing pressures by livestock are likely to increase, as will burning of natural pastures to freshen the plant growth. Extensive areas will be needed for constructing townships, roads, factories and recreational areas. Demand for water will increase and dams and pumped storage schemes for peak demand electricity supply will lead to destruction of biologically important wetlands. The outlook for any natural vegetation in the path of this development looks bleak indeed.

Many of these pressures will strengthen at a gradual, but increasing pace. It is a principle of environmental change that gradual increases in impacts seldom create enough attention to stimulate corrective action, while a short-term change such as flat building on a virgin mountainside, as once proposed near Gordon's Bay, provokes a strong negative response. It is a responsibility of conservationists to provide clear scenarios of a world with conservation and one without.

Encouraging prospects exist for removing some of the worst infestations of alien invasive plants, particularly in the mountain catchments controlled by the Directorate of Forestry. Serious invasive plants such as *Hakea sericea* Schrad. and *Acacia longifolia* (Andr.) Willd. may show declines by the action of biological controls. Some of the worst threats to the flora such as Port Jackson (*A. saligna* (Labill.) Wendl.) are still virtually unchallenged except where valiant efforts are being made using mechanical controls. A more watchful corps of conservationists may prevent other species reaching critical invasive status, as is happening with *Sesbania punicea* (Cav.) Benth.

MOTIVATIONS FOR PREVENTING DECLINE

WORLD CONSERVATION STRATEGY

The World Conservation Strategy (IUCN 1980) gives a guide to the aims, objectives and strategies of conservation on a global scale. It was drawn up by an international team of scientists, economists and sociologists. It concluded that the basic aims of conservation are as follows.

- (1) To maintain essential ecological processes and life-support systems (such as the rehabilitation of worn out soils and their protection against erosion by an intact plant cover, the self-cleansing of waters, and the natural recycling of vital nutrients such as carbon dioxide and oxygen), on which the survival of life and human development depend;
- (2) To preserve genetic diversity (the range of genetic material found in the world's organisms) necessary for the continual breeding of disease resistant animals and crops and for better yields; also of major value for scientific advances, new medicines, technical innovation and the security of many industries which use living resources;
- (3) To ensure the sustainable utilization of species and ecosystems (such as utilized fish and other wildlife, forests and grazing lands) which support millions of people in rural communities and major industries.

Countries which manage to meet these ideals are more likely to prosper in the future. Per capita natural resources are shrinking everywhere with rising needs and uses by an ever growing human population. It is obvious that careful conservation of natural resources has become a national necessity. Meeting the World Conservation Strategy's aims should be seen as the prime standard for humanity's custodianship of planet Earth.

Plants in general are a natural resource which the world cannot afford to waste. It is hard to predict what pattern of utilization will take place in the future, so there is a good argument for conserving as much as possible, including the rarer plants. A brief survey of the motivations for conserving threatened plants is given below.

MOTIVATIONS FOR CONSERVING THREATENED PLANTS

Ecosystem functions: Plants are fundamental elements of the ecosystems which maintain essential ecological processes for the support of life. While most rare species may of course only play a trivial role in ecosystems, some have keystone roles as the specific habitat or food source of associated organisms (Gilbert 1980). An interesting example is the Crab Spider *Synaema* and the Hemipteran Capsid insects of the genus *Pameridia* which are able to live on the treacherous sticky hairs of the peculiar Cape plant family Roridulaceae, where other insects are caught, providing food for the spider (Marloth 1925). Ericaceae and Proteaceae in the Cape provide abundant nectar for nectarivorous birds which in turn act as pollinators, for which the flowers show specific pollination syndromes and phenologies (Rebello et al. 1984).

Value of conserving genetic diversity: Plants hold vast resources of genetic diversity which may prove to be of value in future plant uses or even evolutionary development. In the Cape, a high proportion of this diversity, perhaps as much as one third, is held by rare plants. Some areas hold more diversity than others and should get correspondingly more priority for conservation. The greatest centre of species diversity in the southern and south-western Cape is the Hottentot's Holland and Kogelberg mountain area and the adjacent flats near Somerset West, which were shown to have 26% (476) of a sample of 1 936 species from the Cape Floristic Region (from about Vanrhynsdorp to Port Elizabeth, Oliver et al. 1983). Another centre is the Cape Peninsula which has the astonishing number of 2 256 species of vascular plants, 10% of the total for the whole of southern Africa. Both these areas have been under heavy pressure by land developers, with a correspondingly high rate of loss of populations of rare plants.

In overall terms, the Cape Floristic Region has the greatest concentration of natural plant diversity on the African continent. Hepper (1979) gives a figure of 30 000 species as the total for Africa: this rates the Region's 8 550 species (Goldblatt 1978) as nearly a third (29%) of the continent's land plants. It is important to realize that the potential value of this diversity in terms of useful plants has been far from fully studied. For example, little work has been done to seek medicinal substances in the flora (Watt et al. 1962).

Ethical motivation: It can be argued that people have an ethical duty to afford all the other organisms sharing the planet a reasonable chance of survival. The interlinking of organisms in ecosystems means that each species, in helping create a habitat for others, represents a resource entity. Destruction of a species is therefore equivalent to destroying an ecological resource. Some organisms, very often plants, are resources not only to other species, but also for humanity. Destroying them directly affects humanity besides the other species. It so happens that humanity records the effects of such losses at a much higher level of awareness. In a purist's sense, this puts the human concern on a special, but biologically unjustifiable, plane of attention: the impacts of the losses may in fact be far more serious for species elsewhere in the ecosystem.

Because the extinct plants and animals cannot be re-created, whatever effects their loss may have extends to all future generations of associated species. The present generation has an ethical duty not to reduce the quality of the planet for future generations. Conservation of species must represent a significant part of that duty. This applies particularly to areas with high concentrations of species such as the fynbos and karoo biomes.

Plant diversity for future evolution: Based upon an analysis of about 18 000 fossil plants worldwide, the average duration of plant species has been found to be between four million and fifteen million years (Niklas et al. 1983). The present amount of threat and consequent rate of loss of populations in the Cape suggests an abrupt foreshortening of the duration of its plant species. One may rightly speculate that this loss may be much greater than would be made up by the processes of evolution.

Scientific and medicinal value: The rich mesic and arid floras of the fynbos and karoo biomes will be of outstanding value in the study of population dynamics, microevolution, endemism, gene flow and other key topics, in areas with high local species diversity and with a range of climates, soils and altitudes. The Cape's plants will no doubt be major sources of interesting and potentially valuable substances for study in the fields of biochemistry and the medical sciences. The medicinal values of plants are often unpredictable. For example, there was no prior evidence to suggest the anti-cancer therapeutic properties of the African genus *Maytenus*. There are immense bodies of systematic information to be gleaned from Cape plants, notably the groups which are abundant or peculiar to the area such as the Mesembryanthemaceae, the Proteaceae and endemic families like the Bruniaceae.

Beautification of people's environments: People in the Cape are fortunate in living in a region which possesses many areas of great floral wealth and scenic grandeur. The mountains and parts of the lowlands in the south and south-west are clothed by probably the most species dense flora in the world.

Tourism: It is no surprise that these natural qualities attract tourists that boost the gross regional product of the Cape Town region by nearly 10% (F. Ferrario, pers. comm.). Tourist authorities have referred to the coastal lowlands east of the Bot River as the Garden Route because of its beautiful environmental quality. High quality areas for tourism are widely evident elsewhere, the Cape Peninsula, Namaqualand and the Knysna regions being notable examples. Indigenous plants, including the notable rarities, play a key role in upholding this high environmental quality.

Horticulture: The Cape flora has provided many spectacular additions to world horticulture, including rare plants such as the Endangered Blushing Bride, *Serruria florida* (Proteaceae) and succulents such as members of the Asclepiadaceae and Mesembryanthemaceae.

Wild flower trade: Another practical value of the flora is the use of some outstandingly beautiful species for the 6,5-million Rand wild flower export trade (Brits (1984). This asset needs to be exploited with closer integration of safety measures for rare plants. The wild flower pickers and exporters are increasingly keen to assist with this.

PRIORITIES FOR PREVENTING DECLINE

A first priority in preventing decline is to acquire and maintain a current picture of the threatened species' distribution and ecology. There has been a substantial investment in studies of this kind in the fynbos and karoo biomes. Since 1974 about 145 000 Rands (corrected for inflation this would total at least 250 000 Rands in 1985) of research funds have been spent on the region's threatened-plant survey. The survey's data-bank should constantly receive and store new information on the large number of taxa listed in this report. A recent two-year break in maintenance funding has resulted in a large backlog of entries. Running the data-bank is like keeping a library or curating a herbarium: failure to keep it up to date becomes an increasing nuisance to its regular users.

The next priority is for the conservation authorities to obtain effective funding for rescue and survival programmes. For example, large amounts are needed for purchasing and managing conservation areas in heavily-threatened natural habitats, such as in the Cape's coastal lowlands (Hall 1984b).

Any such publicly allocated funding is a reflection of perceptions placed on other priorities besides conservation. The region has numerous socio-economic problems which are so critical as to earn them high priorities for taking the greatest part of public and private funding. Housing, education, employment, roads, health and welfare are prime targets for support, leaving little for conservation. Active steps need to be taken to mobilize all possible financial sources to solve this problem.

A supplementary operation is to create enough public awareness to make conservation take place as a land-owner's duty, perhaps spurred by tax relief, subsidies or leases which would cost much less than outright purchase. A move in this direction is the South African Natural Heritage Programme, where landowners can conserve choice areas with the aid of management advice, and be officially recognized for their contribution: this is described below in the sections on conservation actions and public involvement.

Training and employment of plant conservationists should also receive attention. There are very few professionally-trained conservation biologists for threatened plants in South Africa. This may be remedied by the new courses started in this field at the University of Cape Town. Numbers of students are being trained in the fundamentals of conservation at the Cape Technikon, but posts for them are reportedly difficult to find.

At present conservation programmes rest primarily with the Directorate of Forestry and the Provincial Nature Conservation Department. The National Botanic Gardens has expressed a commitment to take part and is cultivating isolates from a considerable number of species which are threatened in the wild. The Cape Town City Council and the Divisional Council of the Cape have valuable programmes for conserving threatened plants in their nature reserves. Voluntary bodies, notably the Botanical Society of South Africa and the Wildlife Society of Southern Africa could establish valuable teams for observing threatened plants and warding off threats such as alien vegetation. Both bodies are well-represented by enthusiastic memberships in the western Cape. There is a potential for valuable action by the western Province Agricultural Union: for example, the strong conservation interests of the Villiersdorp Farmers' Association, in a heartland of flora, are well-known.

This shows that action on the conservation of threatened plants is scattered through a wide range of bodies. It needs to have strong co-ordinated development. There is a need for the entire problem to be brought to a single point of focus. This could be provided by establishing a co-operative threatened species authority.

RESEARCH PRIORITIES

Genetical research: Fundamental research is needed on the survival prospects of small populations in genetical terms. This is a critical matter which may easily be overlooked. Studies of inbreeding in animal populations suggest that the populations should be large enough so that no more than 1% of matings should be inbred, to avoid a depression of fitness and a decline of the genetic variability that the animals need to overcome environmental stresses (Frankel & Soulé 1981).

Many plants seem to be different from animals in these respects: for example, some are capable of sustaining high rates of inbreeding with no apparent damage. Some appear to be as sensitive to inbreeding as animals: grown in small, annually reproducing populations they decline after a few years and may only recover if they are cross-bred with individuals imported from elsewhere. Genetical theory, backed by

limited experimental evidence, shows that in a theoretically ideal population a minimum of 50 randomly inter-breeding individuals should allow survival for a few generations in these sensitive species. Because many members of populations do not inter-breed randomly or are too young or too old to breed at all, the numbers may need to be much larger than this (Franklin 1981, Soulé 1981).

Occasionally rare plant populations may crash to a few individuals. Theory indicates that if they recover very rapidly to large numbers, little loss of fitness or genetic variability may ensue except that some rare and important genes may be lost. Continuation at low levels is hazardous except for the plants which seem to tolerate inbreeding.

The core population of a sensitive species should have in theory 500 randomly inter-breeding individuals for genetic safety: once again the actual numbers should be much higher, to several thousand, to make allowance for 'non-participants'. This avoids any chance of an automatic decline, over a number of generations, to extinction. It also copes with the problem of occasional crashes in numbers. Marginal populations may be smaller: this would allow a certain amount of evolutionary experimentation.

Research is needed to show how much these findings, chiefly based on small populations of animals, apply to plants. First should be a survey of the genetic variability of populations selected to represent varying degrees of inbreeding and gene exchange. Interesting work is being done on this elsewhere, suggesting that rare plants seem to have more variability than those which are widespread (Hamrick 1983). Next should be shown by how much small plant populations are liable to leak away genetic variability by the fixation of genes to a homozygous state. This work is fundamental to understanding the numerical and territorial requirements for the long-term conservation of threatened plants.

Research into changes in population structures: An inspection of Appendix 1 shows how many species need more survey data. Threats and population status are continually changing and both should be monitored. Monitoring could be by mapping or simple census-taking in fixed quadrats. Such studies should lay the foundation for valuable work on micro-evolution in small, isolated plant populations.

Autecological research: Autecological studies may be needed to show what pressures are critical threats to survival. Understanding a plant's habitat needs may help with cultivation for bulking up numbers of young plants for restoring populations to their former natural sizes, or for translocation experiments.

SPECIES PRIORITIES

The essential problem here is, given limited facilities and staff, which species should be conserved first? A network of related factors must be considered. There are two main components in setting priorities: the value of the species and the urgency for starting action to prevent further decline. Urgency depends on the rate of change of threats and the tolerances of the threatened species. These and other factors are discussed below.

Values of the plants: Foremost is the potential value of the species to humanity and to the ecosystem of which it forms a part. Values are today seen in practical terms of the supply of immense numbers of rare and unusual substances of medicinal or commercial value; value for scientific study; development of useful plants for crops and cover for difficult restoration programmes; ornamentals for horticulture; and interest value as a draw for tourists.

If it has close economically valuable relatives with which it might be bred for a feature such as high yield or disease resistance, it becomes a more important target for conservation. Some plants may hold cryptic, potential values which cannot be known until they have been identified by research: for such species this line of argument may become so general as to lose much of its strength, except for the fact that some really valuable medicines have been discovered from quite unexpected sources. The African genus *Maytenus*, for example, has yielded compounds which are active in certain forms of cancer.

An additional factor is the distinctness of the species. If it is very distinct it may represent a valuable element of genetic diversity for scientific study or utilization. The Cape's several endemic plant families are a case in point.

Looking to the distant future, if the plant were to survive, how great would be the value of its descendants? Is it likely to evolve into an important and diverse group? Such questions are of course virtually unanswerable, but draw attention to the fact that a species is a continuum and once the thread of its development comes to an end, it cannot be resumed: extinction is forever (Prance and Elias 1977). The essential aim of plant conservation is then to keep both practical and evolutionary options open for the distant future.

This shows that in order to maintain the essential continuity of species, the period of concern for conservation planning should be indefinite, on time-scales of thousands of years. An indefinite period of concern implies that all conservation areas holding rare plants should be proclaimed on a permanent basis.

Because of the evidently rapid increase in population in urban and peri-urban areas especially in the fynbos biome, there is great urgency to strengthen the conservation of nearby natural features before they are destroyed for all time. In particular there is likely to be an exponential rise in the rate of extinction of plants in the south-western coastal lowlands as the areas holding the last remnants of over 600 rare species are wiped out by human pressures: at the present rate of loss and without better conservation a substantial increase in extinction would be evident within the next decade (Hall 1984b).

Urgency: In an ideal situation with strong and widespread conservation measures for a few threatened plants, there would be little need for grading them into categories of urgency. In the fynbos and karoo biomes, with many threatened plants and often not much local 'conservation power', the problem can be crucial. Indeed, present prospects suggest that numbers of plants will go extinct unless some special steps are taken.

Great care should be taken in prescribing levels of urgency. By grading a few species as high priority, attention may be drawn away from others which also should be conserved.

To assess urgency, data are needed on the range and intensity of destructive pressures and whether they are worsening or decreasing. The history of decline of the plant may be valuable here. Data on any plans for urban or agricultural development may help.

A multitude of factors relate to the plant itself: how long could it tolerate delay in the light of increased impacts; how well would it survive in a bridging operation in horticulture; could its seeds be successfully held in a low temperature seed bank as a safety measure; and lastly, could it be translocated to another locality without much difficulty?

Whatever conservation priorities are proposed should be tailored to the probabilities of the needed action taking place as recommended, and the likelihood of the plant's survival while awaiting rescue.

Other schemes for assessing priorities: Several different approaches have been followed elsewhere to assess priorities for conservation. Powell (1974) shows how the California Native Plant Society uses a set of four 3-digit codes to express four co-ordinates of urgency: rarity, endangerment, vigour and degree of endemism. A very rare, highly endangered, much reduced and localized endemic would get scores which would flag maximum urgency for conserving the plant. This scheme assumes that all plants are the same practical or potential value. It makes no allowance for the likely ease of conserving the species or conducting a holding operation while more urgent cases are given attention.

Given (1979) uses variety of factors for New Zealand plants which provide a guide for assessing the urgency of conservation. An endangerment number is given on a linear scale from Extinct to Endangered, Rare, Depleted and Local. A threat number is the sum of scores with equally large, worst-case values for endemism, accessibility and attractiveness. As well as this the plants are categorized according to the IUCN system. Similar objections apply as in Powell's system above.

In Australia, degree of endemism is encoded separately from conservation status, which is given as endangered and in serious risk of disappearing within a decade; vulnerable, at risk over more than ten years or if land uses were to change; rare or at risk but in a nature reserve; similarly but not in a nature reserve; and subject to heavy exploitation in the wild state (Good 1979). Endemism and conservation make up the co-ordinates of a table which gives a useful insight into conservation priorities: however it fails to give the species' value and tolerance of delay as noted above.

Conclusions: Assessments of species priority should chiefly take into account three main factors. These are: the value of the plants to humanity or to an ecosystem if known; the present state and likely forthcoming changes in threats; and the probable ability of the plant to survive while conservation gets under way. This last factor relates to the staff and financial resources at hand. Priority ratings are estimated for about 250 plants in Appendix 1.

CHECKLIST OF CONSERVATION ACTIONS

The following checklist is offered as a guide for indicating the range of actions which may be followed in conserving a plant. A further source is the report on the conservation of ecosystems, by Siegfried and Davies (1982).

RESCUE AND SURVIVAL TEAMS

Threatened plants are often seen as a part of the local commonage, belonging to no-one in particular. They sometimes occur on the property of a landowner whose priorities are remote from flora conservation. Experience elsewhere has shown that appointing one or more persons as a 'rescue and survival team' brings useful results.

The team, which would rely strongly on keen amateurs, would act upon from one to twenty species. Each species is investigated and documents are drawn up proposing the rescue methods, which are then reviewed by professional conservationists acting as referees. The reviewed documents are considered by a conservation authority who negotiates for funding. The proposed conservation actions are then taken, followed by monitoring for a subsequent period (a number of plant generations) to confirm their success and to alert authorities if any further action is required.

The possibility of using this approach, with the aid of voluntary bodies such as the Botanical Society of South Africa and the Wildlife Society of Southern Africa, is being investigated. Already several volunteer actions have proved successful on critical species such as *Protea odorata* Thunb. (University of Cape Town students' Botany Club) and *Serruria furcellata* N.E. Br. (Fish Hoek Mountain Weeders' Association).

EMERGENCY ACTIONS

Storage of seed in a low temperature seed-bank: A temporary seed-bank has been established by the Threatened Plants Research Group at the University of Cape Town. Seeds are cleaned of all extraneous material, dried over anhydrous silica gel for 4-5 weeks, and then stored at about minus eighteen degrees Celsius. The seed-bank is reserved for plants of Endangered status, as an emergency rescue measure.

Seed should ideally be collected from some 500 individuals, and, subject to the strict proviso of not jeopardising the population by excessive depletion of seeds, the following stocks should be obtained. A first standard collection should have 10 000 seeds, to provide adequate stocks (assuming only 20% germination success) for long-term storage; a duplicate set for storing at another centre; batches for testing to find optimal germination and cultivation conditions, and a final set for the re-establishment of natural populations. With seriously threatened plants, the first standard may be unattainable.

Cultivation for a few generations for bulking up and return to the habitat: The National Botanic Gardens at Kirstenbosch grows usually small numbers of threatened plants. Ideally, to overcome the special hazards of horticulture, a population of some 1 000 to 4 000 plants, well isolated so as to reduce possible risks of hybridization, is needed. This may be necessary for genetic viability for annuals but larger perennials would have to rely upon their slow turnover to meet the genetic problems of a bottleneck situation formed as small survivor populations in a botanic garden. The ultimate aim would be to obtain enough seed or seedlings for a major re-establishment programme in wild habitats, achieved with as few generations as possible elapsing after the plant had been brought into the botanic garden.

COMBATting THREATS

Agricultural threats: Ploughing and grazing are major impacts in many parts of the southern and south-western Cape and an efficient information-service is needed to assist the Department of Agriculture in ensuring adequate conservation standards for threatened plants in farming areas.

Flower picking and the live plants trade: Strict enforcement of the regulations should be maintained and cooperative programmes on rare plant monitoring and conservation developed. More funds and staff should be provided to allow greater attention to be given to monitoring the export of succulents.

Exotic plants: The methods for removing exotic plants may be obtained from the Directorate of Forestry, or if biological control is a likely measure, the Plant Protection Research Institute at Stellenbosch.

Exotic animals: Major attention should be given to curbing invasions by the Argentine Ant, which fails to carry out the important protective function of storing seeds underground, as done by the indigenous ants which it suppresses when it spreads into their territory. The Himalayan Tahr caused destruction of plants and soil erosion on the slopes of Table Mountain and Devil's Peak.

Microscopic pathogens: Many soils in the fynbos biome are infected with the fungus *Phytophthora cinnamomi*. When a marked sign of mortality occurs in a rare plant population, tests should be made for this fungus by the Plant Protection Research Institute at Stellenbosch and advice sought for control. Quarantine measures may be needed to avoid having visitors spreading the pathogen to other individuals.

Afforestation: Pine and Eucalypt plantations represent a most inhospitable habitat for almost all fynbos plants, and the trees tend to draw out groundwater to the extent that streams and down-slope habitats become much drier. The Directorate of Forestry has indicated that very little more afforestation is planned in the south-western Cape. The Directorate has a well-developed programme of monitoring threatened plants on its land, principally in mountain catchments in the fynbos biome.

Veld fires and firebelts: Excessively frequent fires may be a severe hazard for those plants requiring some ten or more years to build up adequate seed-stores. Fire planning should take account of the fact that accidental fires frequently shorten the intended fire cycle, with disastrous results. Particular care should be taken to avoid spring fires as this has proved to be a sensitive time for many fynbos plants in their reproductive phase.

Footpaths and trampling: Paths or hiking trails should be routed well clear of known threatened plant sites.

Urban threats: Due to the great number of associated threats, maximum care should be exercised in new urban development, particularly as many extensions are based upon zonings drawn up many years ago when the threatened plant problem seemed far less serious than today. Wherever possible, these long-standing zonings should be reviewed when they lie near areas of obviously important natural plant diversity.

Quarrying: In spite of care taken with replacing overburden, quarrying represents one of the worst kinds of habitat interference for threatened plants. The precaution should be taken in planning any new quarry to consult beforehand with bodies such as the Threatened Plants Research Group at the University of Cape Town or the Directorate of Forestry. There are indications that topsoil dumping while the quarrying is in progress may go 'stale' after a few years, killing off much of the contained natural seed.

Rubbish dumping: The physical disturbance and importation of weeds associated with rubbish dumps may have serious local impacts on a habitat. In addition, mineral nutrients flowing in drainage from the dump may alter delicate balances in the generally nutrient-poor soils of the region.

Drainage: Wetlands are a sensitive and often very localized habitat of numbers of threatened plants: they are often rated as wasteland which should be drained for other land uses. Road cuttings across slopes may impede the natural drainage to moist plant habitats at lower levels.

Optimal cultivation methods for use with seed-banks and bulking-up operations: Knowledge of the best cultivation methods for plants stored as seed or subjected to emergency bulking-up operations in a nursery is essential (Hall & Rycroft 1979). A technical horticultural journal is needed to record this important information.

RESTORATION OF POPULATIONS AND HABITATS

The building up of populations to putative former numbers: The aim would be to ensure maximum seed-set in the natural populations, or to transfer seed or healthy, disease free nursery seedlings into the wild habitat. Genetic stocks originating from the local populations must always be used when transferring seeds or plants back into the wild. Attention may have to be given to boosting the populations of essential associates; these may be plants supplying essential shade, shelter or nutrient balances, or animals functioning as pollinators, seed dispersers or feeders controlling insect pests. The sophisticated nature of this work demands a close liaison with research teams.

The re-establishment of essential habitat features: Inspection of the site is necessary for evaluating defects such as altered drainage, soil erosion and compaction after trampling. Where the site has been mined for gravel and returned topsoil has been eroded away too fast for it to be fixed by the roots of pioneer plants, a further topsoiling operation may have to be carried out. Only soil from the same habitat in the surroundings should be used.

ESTABLISHMENT OF NATURE RESERVES

Establishment of a nature reserve at a threatened plant's habitat: While the above re-establishment operations are under way, the plant's habitat should, if possible, be reserved as a sanctuary, with no admittance except to the conservators. Nature reserves should be established to be inviolable and permanent. Under exceptional circumstances they may be temporary, when no option exists for removing threats and the plant must be translocated to another site: the threatened habitat must then be reserved as far as possible while this is taking place. A total of 101 conservation areas are recommended in a report on the south-western Cape's coastal lowlands, an area which has large numbers of plants and entire ecosystems critically at risk (Hall 1984b).

Alternatives to purchase of conservation areas: Alternatives to outright purchase are acquisition of leases or easements (rights of access), often with provisions for protection against damaging impacts. These may perhaps lead in the future to donation or purchase of a portion of the property to serve as a nature reserve (Hoose 1981, Hall 1984b).

Translocation of the plant to an existing reserve: Seed, seedlings, cuttings or adult plants may be taken from an endangered site to a strictly comparable habitat in a nature reserve. The new site should be chosen after full consultation with a professional plant ecologist or conservation biologist. A special risk to be avoided is hybridization with related plants which might produce populations in which most of the genetic material of the threatened species is lost. A theoretical risk is that the essential animal associates (pollinators, seed dispersers, predators on insect pests) may be missing in the new habitat: in practice it is not known how important this may be in the fynbos. The rescue team for translocation should be prepared for a programme lasting at least ten to twenty plant generations: repeated attempts may be needed to establish the plant, using a number of local habitat variants at the new site.

Creation of a nature reserve elsewhere and the translocation of the plant to it: The above considerations should come into this important element of a rescue programme.

MONITORING

Establishment of monitoring teams: This may be delegated to interested local persons as is being done successfully in a project to monitor rare *Banksia* (Proteaceae) populations in Australia (Taylor & Hopper 1984). Visits are made to threatened plants and sight record forms are completed describing the state of the populations. The data are returned to a conservation centre where they are stored for use in a computer data-bank. Reports are sent half-yearly to all contributors. This programme has met with an enthusiastic response. New populations are discovered and remote sites are visited which would otherwise involve costly expeditions by the conservation authority.

Establishment of checklist of items for monitoring: For critically threatened species, the main sensitive aspects of the populations should be monitored, such as the approximate numbers of individuals, the status of threats identified during the rescue operation and the appearance of any new hazards to the plants.

Revision of conservation actions: A programme for rescue and survival of some threatened plants may need revision if monitoring shows no improvement after previous conservation actions.

PUBLIC INVOLVEMENT

National and international importance: The public should be informed of the region's high quality natural features which require conservation as a matter of national and international importance. This is widely overlooked and could be an aid in securing better conservation standards.

Environmental interpretation for public information and guidance: A long-term strategy for the survival of natural features is to introduce environmental interpretation, in the form of on-site guidance to the public at places of special interest, thereby helping to establish better care for the beauty of the Cape, as a community tradition. There is a general lack of such guidance in the Cape Province. Methods for developing interpretation programmes are described in a booklet based upon overseas experience and adapted to the special qualities of the Cape Peninsula (Hall 1983b). People could be shown the richness and localization of plants at a fynbos site; the state of the threatened plant problem; and the destructive effect of various impacts.

Landowner and occupier interests: Close attention should be given to the interests of landowners and occupiers, particularly their attitudes and behaviour in relation to nature conservation. A conservation extension service should be established in the region to guide landowners and occupiers. A study has recently shown that the factors influencing landowner behaviour fall into two broad categories, attitude-related and finance-related. Attitude factors govern the acceptance of conservation principles and values, while financial factors control their practical application (C. McDowell, pers. comm.). The integration of a nature reserve system with public interests and with development will require attention to both categories (Hall 1984b).

Natural Heritage Programme: A recent development is the announcement of a National Heritage Programme which aims to enlist the support of landowners and farmers in increasing the extent of conserved areas in South Africa. Sites on private land carrying threatened plants would qualify for the programme. In return for conserving the site against impacts, the landowner will be given a bronze plaque, a certificate, professional management advice and, if essential, help with fencing and other protective measures. The landowner would undertake not to destroy or degrade the site, to allow representatives of the Department of Environment Affairs to visit it, to report any adverse changes to it, and to give 60 days notice of intention to use it for another purpose. This will give conservation authorities time to assess whether the land is valuable enough to warrant further action such as long lease, outright purchase or partial compensation. The Southern African Nature Foundation has lent formal support to the scheme. As a prime part of the programme, landowners should be notified of the presence of threatened plants on their property and be informed of its requirements for survival.

Financial incentives for conservation by landowners: Methods of financially assisting private conservation efforts should be investigated. The aim should be to provide incentives to landowners and occupiers along the lines of either subsidies or by applications for tax deductions. Such incentives would be helpful support to the National Heritage Programme.

Law enforcement: Legislation must be applied to back up education and good management of conservation areas. This will require rationalization of legislation; blocking up of loopholes; pooling of enforcement staff by all authorities; training of enforcement staff; and penalties for contraventions that will be effective deterrents. Proclaimed conservation areas should have the best legal protection: it should only be possible to de-proclaim them by Act of Parliament (such as is the case at present for National Parks and Wilderness Areas).

REFERENCES

- Ayensu E S & DeFilipps R A, eds. 1978. Endangered and threatened plants of the United States. Smithsonian Institution and World Wildlife Fund, Washington D C. 301 pp.
- Boucher C 1981. Autecological and population studies of *Orothamnus zeyheri* in the Cape of South Africa. pp. 343-353 in Syngé H, ed.: The biological aspects of rare plant conservation. John Wiley & Sons, Chichester. 558 pp.
- Boucher C 1983. Floristic and structural features of the coastal foreland vegetation south of the Berg River, Western Cape Province, South Africa. *Bothalia* 14: 669-674.
- Brits G J 1984. South African Proteas — historical review. *Protea News*, Pretoria 1: 7-9.
- Chesser R K 1983. Isolation by distance: relationship to the management of genetic resources. pp. 51-65 in: Schonewald-Cox C M et al., eds.: Genetics and conservation. Benjamin/Cummings, Menlo Park, California. 722 pp.
- Frankel O H & Soulé M E 1981. Conservation and evolution. Cambridge University Press, Cambridge. 327 pp.
- Franklin I R 1980. Evolutionary change in small populations. pp. 135-149 in Soulé M E & Wilcox B A, eds.: Conservation biology — an evolutionary-ecological perspective. Sinauer Associates, Sunderland, Massachusetts. 395 pp.
- Fuggle R F 1983. Population growth and resource demands. pp. 23-29 in Fuggle R F & Rabie M A, eds.: Environmental concerns in South Africa. Juta, Cape Town. 587 pp.
- Gibbs Russell G E 1985. PRECIS: the National Herbarium's computerised information system. *South African Journal of Science* 81: 62-65.
- Gilbert L E 1980. Food web organization and the conservation of neotropical diversity. pp. 11-33 in Soulé M E & Wilcox B A, eds.: Conservation biology — an evolutionary-ecological perspective. Sinauer Associates, Sunderland, Massachusetts. 395 pp.
- Given D R 1979. Threatened plants in New Zealand. pp. 22-45 in Anonymous: A vanishing heritage: the problem of endangered species and their habitat. Nature Conservation Council, Wellington, New Zealand. 273 pp.
- Goldblatt P 1978. An analysis of the flora of southern Africa: its characteristics, relationships, and origins. *Annals of the Missouri Botanical Garden* 65, 369-436.
- Good R 1964. The geography of the flowering plants. 3rd ed. Longmans, London. 518 pp.
- Good R B 1979. Current Australian work on endangered flora. pp. 5-21 in Anonymous: A vanishing heritage: the problem of endangered species and their habitat. Nature Conservation Council, Wellington, New Zealand. 273 pp.
- Hall A V 1978. Endangered species in a rising tide of human population growth. *Transactions of the Royal Society of South Africa* 43: 37-49.
- Hall A V 1981. Information handling for South Africa's rare and endangered species survey. pp. 167-184 in: Morse L E and Henifin M S, eds.: Rare plant conservation: geographical data organization. New York Botanical Garden, Bronx. 377 pp.
- Hall A V 1982a. Rare Plants Gazette 1. Threatened-plants research group, University of Cape Town, 26 pp.
- Hall A V 1982b. Rare Plants Gazette 2. Threatened-plants research group, University of Cape Town, 30 pp.
- Hall A V 1982c. Rare Plants Gazette 3. Threatened-plants research group, University of Cape Town, 36 pp.

- Hall A V 1983a. Threatened plants at the South-Western corner of Africa. *Bothalia* 14: 981-984.
- Hall A V, ed. 1983b. Interpreting the environment. A manual on ways of guiding the public in understanding natural and man-made environments. Plate Glass Foundation and the Cape Peninsula Conservation Trust, Cape Town. 18 pp.
- Hall A V 1984a. Rare Plants Gazette 4. Bolus Herbarium, University of Cape Town. 40 pp.
- Hall A V, ed. 1984b. Proposals for nature conservation areas in the coastal lowlands of the South-Western Cape Province: Report to the Minister of Environment Affairs. Department of Environment Affairs, Cape Town.
- Hall A V & Ashton E R 1983. Threatened plants of the Cape Peninsula. Threatened-Plants Research Group, Bolus Herbarium, University of Cape Town. 26 pp.
- Hall A V, de Winter B, Fourie S P & Arnold T H 1984. Threatened plants in Southern Africa. *Biological Conservation* 28, 5-20.
- Hall A V, de Winter M, de Winter B & van Oosterhout S A M 1980. Threatened plants of Southern Africa. South African National Scientific Programmes Report No. 45, CSIR, Pretoria. 244 pp.
- Hall A V & Rycroft H B 1979. South Africa: the conservation policy of the National Botanic Gardens and its regional gardens. pp. 125-134 in Syngé H and Townsend H, eds.: *Survival or Extinction*. Bentham-Moxon Trust, Kew. 250 pp.
- Hamrick J L 1983. The distribution of genetic variation within and among natural plant populations. pp. 335-348 in Schonewald-Cox C M, Chambers S M, MacBryde B & Thomas W L, eds.: *Genetics and conservation — a reference for managing wild animal and plant populations*. Benjamin/Cummings, Menlo Park, California. 722 pp.
- Hanks J 1984. Conservation for development. pp. 31-38 in Mundy P J, ed.: *Proceedings of an international symposium on the extinction alternative*. Endangered Wildlife Trust, Johannesburg. 182 pp.
- Harper J L 1977. *Population biology of plants*. Academic Press, London. 892 pp.
- Harper J L 1981. The meanings of rarity. pp. 189-203 in Syngé H, ed.: *The biological aspects of rare plant conservation*. John Wiley & Sons, Chichester. 558 pp.
- Hedberg I 1979. Possibilities and needs for conservation of plant species and vegetation in Africa. pp. 83-104 in Hedberg I, ed.: *Systematic botany, plant utilization and biosphere conservation*. Almqvist & Wiksell International, Stockholm. 159 pp.
- Hepper F N 1979. Africa. pp. 41-46 in Hedberg I, ed.: *Systematic botany, plant utilization and biosphere conservation*. Almqvist and Wiksell International, Stockholm. 159 pp.
- Hilton-Taylor C, in preparation. *Studies of the vegetation of the karoo-namib biome in South Africa*.
- Hoose P M 1981. *Building an ark: Tools for the preservation of natural diversity through land protection*. Island Press, Covello, California. 221 pp.
- IUCN 1980. *World conservation strategy*. International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland.
- Lucas G L, ed 1980. First preliminary draft of the list of rare, threatened and endemic plants for the countries of North Africa and the Middle East. IUCN Threatened Plants Committee, Kew. 170 pp.
- Lucas G & Syngé H, eds 1978. *The IUCN plant red data book*. International Union for the Conservation of Nature and Natural Resources, Morges, Switzerland. 540 pp.
- Lucas G L & Walters S M, eds 1976. *List of rare, threatened & endemic plants for the countries of Europe*. IUCN Threatened Plants Committee, Kew. 166 pp.
- Marloth R 1925. *The Flora of South Africa*. Volume II, Part I, pp. 26-30. Darter Brothers, Cape Town. 122 pp.

- Milton S J & Hall A V 1981. Reproductive biology of Australian Acacias in the South-Western Cape Province, South Africa. *Transactions of the Royal Society of South Africa* 44: 465-487.
- Moll E J & Bossi L 1984. Assessment of the extent of the natural vegetation of the fynbos biome of South Africa. *South African Journal of Science* 80: 355-358.
- Moll E J, Campbell B M, Cowling R M, Bossi L, Jarman M L & Boucher C 1984. A description of major vegetation categories in and adjacent to the fynbos biome. South African National Scientific Programmes Report No. 83, CSIR, Pretoria. 29 pp.
- Moll E J & Gubb A A 1981. Aspects of the ecology of *Staavia dodii* in the south-western Cape of South Africa. pp. 331-342 in Syngé H, ed.: *The biological aspects of rare plant conservation*. John Wiley & Sons, Chichester. 558 pp.
- Niklas K J, Tiffney B H & Knoll A H 1983. Patterns in vascular land plant diversification. *Nature*, London 303, 614-616.
- Oliver E G H, Linder H P & Rourke J P 1983. Geographical distribution of present-day taxa and their phytogeographical significance. *Bothalia* 14: 427-440.
- Powell W R 1974. Inventory of rare and endangered vascular plants of California. California Native Plant Society, Special Publication No. 1. 56 pp.
- Prance G T & Elias T S, eds. 1977. *Extinction is forever — threatened and endangered species of plants in the Americas and their significance in ecosystems today and in the future*. New York Botanical Garden, Bronx, New York. 437 pp.
- Rebello A G, Siegfried W R & Crowe A A 1984. Avian pollinators and the pollination syndromes of selected mountain fynbos plants. *South African Journal of Botany* 3: 285-296.
- Salas R M 1981. State of the world population. Populi — Journal of the United Nations Fund for Population Activities 8: 3-11.
- Siegfried W R & Davies B R, eds. 1982. *Conservation of ecosystems: theory and practice*. South African National Scientific Programmes Report No. 61, CSIR, Pretoria. 93 pp.
- Soulé M E 1980. Thresholds for survival: maintaining fitness and evolutionary potential. pp. 151-169 in Soulé M E & Wilcox B A, eds.: *Conservation biology — an evolutionary-ecological perspective*. Sinauer Associates, Sunderland, Massachusetts. 395 pp.
- Soulé M E 1983. What do we really know about extinction? pp. 111-124 in Schonewald-Cox C M et al., eds.: *Genetics and conservation*. Benjamin/Cummings, Menlo Park, California. 722 pp.
- Stirton C H, ed. 1978. *Plant invaders — beautiful but dangerous*. Department of Nature and Environmental Conservation of the Cape Provincial Administration, Cape Town. 175 pp.
- Takhtajan A L 1969. *Flowering plants: origin and dispersal*. Translated by C Jeffrey. Oliver and Boyd, Edinburgh. 310 pp.
- Tamm C O 1972. Survival and flowering of perennial herbs. III. The behaviour of *Primula veris* on permanent plots. *Oikos* 23: 159-166.
- Walsh B N 1968. Some notes on the incidence and control of driftsands along the Caledon, Bredasdorp and Riversdale coastline of South Africa. Department of Forestry Bulletin 44: 1-79.
- Walter H 1968. *Die vegetation der erde*. Band II. Gustav Fischer, Jena. 1001 pp.
- Watt J M & Breyer-Brandwijk M G 1962. *Medicinal and poisonous plants of southern and eastern Africa*. 2nd ed. Livingstone, Edinburgh. 1457 pp.
- Wright S 1943. Isolation by distance. *Genetics* 28: 114-138.

APPENDIX 1: THREATENED, RARE AND EXTINCT PLANTS OF THE KAROO AND FYNBOS BIOMES

The compilation given below is essentially preliminary, mainly due to the large amounts of information needed on most of the species which have been included. Both the taxonomic and the conservation bases of the list change at a low but significant rate. New taxonomic revisions are continually appearing, containing descriptions of recently discovered rare species and sinkings of listed names which make the plants assigned to them no longer candidates for conservation. Listings of threatened plants need frequent alteration due to continual changes among surviving populations, in response to altering habitat pressures. The changes are especially marked in regions where human impacts are high. It is clear from this that no account of threatened plants can be final or complete.

The taxa are given in alphabetical sequence. This is more easily used for reference than the listings under families in the account for southern Africa (Hall et al. 1980); in general, grouping by family proved to have little heuristic value for conservation. To assist in recognizing affinities, the family name is given with each genus.

The taxon name is followed by the IUCN conservation-status, and where known, the life-form, flowering-period, grid-area and threats to survival. The grid-area is given as a number incorporating the degrees of latitude and longitude of the north-west corner of the 1-by-1 degree area in which a species occurs, followed by a letter which gives the site's 1/2-by-1/2 degree area read alphabetically like the lines of a book from the upper left to bottom right, followed by another letter giving the 1/4-by-1/4 degree sub-division. Doubtful data are indicated by a question-mark. No other locality information is given, to avoid public disclosure of threatened plant sites.

In about 250 cases where the plant's conservation has been investigated more fully, a guide is given to the status of the remaining populations, the factors threatening their present and future survival, and any rescue measures which are being employed to combat the threats. A rough estimate is given of the likely urgency for undertaking further rescue action.

The list below brings together the taxonomic and ecological studies of a large number of botanists listed in the acknowledgements. It would be beyond the scope of this work to cite individual sources of these data for each species. Authors of taxonomic names and literature references to systematic and ecological data are therefore omitted. This information is available on consultation at the data bank at the Bolus Herbarium, University of Cape Town.

- Acmadenia alternifolia* (Rutaceae): Critically Rare; shrub; May-December; 3423AA/AB
- A. argillophila*: Endangered; shrub; June-September; 3320AC
- A. baileyensis*: Vulnerable; shrub; November; 3321CB
- A. candida*: Extinct; shrub; March-May; 3419AA
- A. gracilis*: Vulnerable; shrub; October-December; 3322CC
- A. laxa*: Vulnerable; shrub; June-October; 3420BA
- A. macradenia*: Critically Rare; shrub; August-December; 3218BD, 3219CA, 3219CB
- A. maculata*: Endangered; shrub; July-August; 3322CD/DA/DC. Population status: formerly known from three populations, one of which has recently been extirpated. The remaining two populations are threatened by grazing and frequent burning.
- A. matroosbergensis*: Critically Rare; shrub; September-November; 3319BC/DA
- A. nivea*: Vulnerable; shrub; February-November; 3418BB/BD
- A. nivenii*: Critically Rare; shrub; September; 3321CC

- A. patentifolia*: Critically Rare; shrub; September-November; 3219CB/DC
- A. rupicola*: Vulnerable; shrub; March, July, December; 3322CC. Population status: known from two populations, each with about 100 individuals and covering about 0,5 ha. Although in a well-studied area, no other populations are known. The plants are about 50 years old and are only about 50 cm high. The populations, being small, may be in a state of genetic decline from inbreeding. The plant only grows in very shallow pockets of soil on a rocky ridge, evidently protected from fire. The sites are in a Forestry-controlled area.
- A. tenax*: Critically Rare; shrub; January-February; 3319AD/CB
- Acrolophia bolusii* (Orchidaceae): Vulnerable; tussock-plant; October-December; 3318CB/CD, 3418AB/BA
- A. lunata*: Critically Rare; tussock-plant; November-December; 3320DD, 3322CD, 3323CD/DB
- A. ustulata*: Endangered; tussock-plant; November-December; 3321DD, 3322CC, 3418AB/AD
- Acrostemon xeranthemifolius* (Ericaceae): Indeterminate; shrublet; August-October; 3419AD
- Adenandra dahlgrenii* (Rutaceae): Critically Rare; shrublet; all year; 3320DA
- A. gracilis*: Indeterminate; shrublet; September-October; 3419BB
- A. multiflora*: Indeterminate; shrublet; August-November; 3418BB, 3419BB
- A. marginata* ssp *mucronata*: Critically Rare; shrublet; July-October; 3119AC, 3218BB, 3219AA/AC
- A. odoratissima* ssp *odoratissima*: Critically Rare; shrublet; August-October; 3419DA/DB
- A. odoratissima* ssp *tenuis*: Critically Rare; shrublet; September-October; 3419DD
- A. schlechteri*: Indeterminate; shrublet; April-July; 3419DA/DB
- A. villosa* ssp *apiculata*: Critically Rare; shrublet; September-November; 3419BB, 3320CC
- A. villosa* ssp *imbricata*: Critically Rare; shrublet; October-February; 3319CA/CD/CC
- A. villosa* ssp *pedicellata*: Indeterminate; shrublet; August-November; 3219AA/CC, 3319AA
- A. villosa* ssp *robusta*: Critically Rare; shrublet; September-November; 3319CD, 3418BD
- A. villosa* ssp *umbellata*: Critically Rare; shrublet; August-November; 3318CD
- Adenium oleifolium* (Apocynaceae): Indeterminate; succulent shrub; June, November; 2818?, 2821?, 2922?
- Adenocline stricta* (Euphorbiaceae): Critically Rare; herb; August-April; 3419DA/DD
- Adromischus diabolicus* (Crassulaceae): Indeterminate; succulent; 2817D, 2918BB
- A. humilis*: Uncertain; succulent; January; 3222BA
- A. marianae*: Uncertain; succulent; March; 3218BB/BD
- A. phillipsiae*: Uncertain; succulent; March; 3220DA
- Agapanthus walshii* (Alliaceae / Liliaceae): Critically Rare; perennial herb; December-March; 3418BB, 3419AA
- Agathosma abrupta* (Rutaceae): Indeterminate; shrublet; August-September; 3419DA
- A. adnata*: Critically Rare; shrublet; November-January; 3219AC/CB
- A. affinis*: Critically Rare; shrub; August; 3322AA/DB

- A. alaris:** Uncertain; shrub; 3423AB
- A. bicolor:** Critically Rare; shrub; August-September; 3218BB, 3219AA. Population status: a few small populations, one with several hundred plants in 0,04 ha. History: only known from a limited area: a very narrow endemic. Threats: limited browsing by indigenous animals appears to be a minimal threat; fires are apparently not over-frequent. The plants are in a Forestry-controlled area.
- A. capitata:** Critically Rare; shrub; September-November; 3218DA/DC/DD
- A. cephalodes:** Uncertain; shrub; September-November; 3218DA. Part of a taxonomic complex with other rare plants in a specialized group. *A. involucrata* and *A. sabulosa*. Population status: previously known from three small areas, now extirpated at one since 1977 by ploughing for grain crops. Rescue measures: none at present; a nature reserve is urgently needed for this and other threatened plants in the region. Urgency for conservation: high priority.
- A. concava:** Critically Rare; shrub; December-March; 3319AD
- A. conferta:** Critically Rare; shrub; December; 3219AA. Population status: small populations of some fifteen plants in rock gullies, only known from a single mountain summit. The only likely threat may be over-frequent fires. The site is in a Forestry Wilderness Area. The population had few seedlings, indicating low vigour.
- A. cordifolia:** Uncertain; shrub; October; 3219CA
- A. corymbosa:** Endangered; shrub; May-October; 3318AD/BC/CB/CC/CD/DC, 3418BA
- A. decurrens:** Uncertain; shrublet; October; 3319CA
- A. dentata:** Critically Rare; shrublet; August; 3219CB
- A. dielsiana:** Vulnerable; shrub; April-October; 3322DC, 3420AD/BD/CA, 3421AB/AD. Population status: the plant occurs in a few widely dispersed sites in areas at the coast with widespread threats, including alien *Acacia* infestations, grazing, quarrying, burning and housing development. Cultivation: the plant is attractive and has high potential. Urgency for conservation: medium priority.
- A. distans:** Critically Rare; shrub; September; 3219AA
- A. elata:** Uncertain; shrub; September-November; 3118DC, 3218BB
- A. eriantha:** Vulnerable; shrub; September-November; 3420CA/BD, 3421AD. Population status: has been found in a few places on coastal limestone hills: a population studied at one place had up to a thousand plants in an area of several hectares. At another place, about 100 plants were seen in 0,5 ha. Threats at the two sites included invasion by *Acacia cyclops*, grazing, quarrying and housing construction. Urgency for conservation: medium priority.
- A. florida:** Uncertain; shrub; September; 3320CA
- A. foleyana:** Critically Rare; shrub; January; 3319BC
- A. glabrata:** Indeterminate; shrub; July-December; 3318AB/CD/DC, 3418AB
- A. glandulosa:** Vulnerable; shrub; July-October; 3318AD/BC/CB/DA/DB
- A. gnidiiflora:** Indeterminate; shrub; November; 3421AB
- A. involucrata:** Endangered; shrub; September-October; 3218BD/DA. Population status: 70 plants in a single colony. Threats: ploughing. Urgency for conservation: high priority.
- A. lancifolia:** Uncertain; shrub; October; 3218DB, 3319AC
- A. leptospermoides:** Critically Rare; shrub; February, April, October; 3319DC, 3419BA

- A. linifolia:** Uncertain; shrub; July-August; 3320CD/DC, 3420AB
- A. marifolia:** Uncertain; shrub; June-November; 3118DC, 3218BC/DB/DC/DD, 3318BA
- A. martiana:** Critically Rare; shrub; July-September; 3323DD
- A. minuta:** Endangered; shrub; September; 3419DB, 3420AA
- A. orbicularis:** Extinct; shrub; July-November; 3418BB, 3419AB/BA. Population status: formerly only known from a single locality, near the Caledon Hot Baths which is now densely infested with large thickets of invasive plants: these were probably the main pressure which made the plant extinct. Other pressures in the area are road-building, gravel-mining, grazing and burning. Extensive searches for the plant have been made by at least five botanists in the vicinity.
- A. pallens:** Indeterminate; shrub; November-February; 3421BA
- A. pattisonae:** Uncertain; shrub; December; 3219AC/AD
- A. phillipsii:** Critically Rare; shrublet; December-January; 3319BC
- A. planifolia:** Critically Rare; shrub; January; 3322CC/CD/DD, 3323CC
- A. rehmanniana:** Uncertain; shrub; 3321CD
- A. sabulosa:** Uncertain: may be allied to *A. cephalodes*; shrub; September-October; 3220BC
- A. salina:** Critically Rare; shrub; August; 3218BA, 3219AC/CA. One or possibly two populations are known: the second may be an erroneous locality. Population status: about 20 vigorous plants were seen in a 100 m² area. No threats were evident: the plant seems to be naturally rare. Cultivation: not grown, but has potential as an ornamental. Urgency for conservation: medium priority.
- A. spinosa:** Uncertain; shrub; September-November; 3323CA/CB
- A. sp. nov. (P.A. Bean 480):** Critically Rare; shrub; October; 3419CB. Population status: scattered plants along limestone ridges: an area of 3 ha had many hundreds of vigorously growing individuals. Threats: adequately buffered by fynbos, although *Acacia cyclops* is present in nearby valleys.
- A. stenosepala:** Critically Rare; shrub; September-October; 3319CC
- A. stokoei:** Critically Rare; shrub; November; 3418BB, 3419BD
- A. subteritifolia:** Critically Rare; shrub; September; 3319DB, 3320CA
- A. thymifolia:** Critically Rare; shrub; August-October; 3317BB, 3318AA/AB. Population status: locally plentiful in a scattered population about 6 km long. Threats: alien plants and grazing are not currently serious problems. Urgency for conservation: minimum priority.
- A. umbonata:** Critically Rare; shrub; September; 3320DD. Population status: small populations on a localized mountain ridge system: 100 plants seen on a ridge 1,3 km long. Only possible threats are over-frequent fires (the plant reproduces by seed).
- A. uncarpellata:** Critically Rare; shrub; July-August; 3324CA/CB/DA, 3424BB
- A. zwartbergense:** Critically Rare; shrub; February; 3322BC/DB
- Alciope lanata (Asteraceae):** Uncertain; perennial herb; October-March; 3219CD, 3319AA/AC
- Aloe buhrii (Asphodelaceae / Liliaceae):** Critically Rare; succulent; 3119AA
- A. distans:** Critically Rare; succulent; December; 3218AB, 3317BB, 3419AB
- Ammocharis herrei (Amaryllidaceae):** Critically Rare; geophyte; May; 2917DC
- Amphiglossa callunoides (Asteraceae):** Uncertain; shrublet; January-April; 3325CD/DC, 3419DB

- A. corrudaefolia*: Uncertain; shrublet; November; 3017BB
- Amphisiphon stylosa* (Hyacinthaceae / Liliaceae): Endangered; geophyte; June; 3119AC
- Anaxeton angustifolium* (Asteraceae): Uncertain; shrublet; September; 3319AD
- A. brevipes*: Critically Rare; shrublet; August-October; 3419BA/BB
- A. ellipticum*: Critically Rare; shrublet; September-December, June; 3319CC, 3418BB
- A. hirsutum*: Critically Rare; shrublet; April, October, November; 3419BA/BB
- Androcymbium cruciatum* (Colchicaceae / Liliaceae): Uncertain; geophyte; August; 2917BC
- A. fenestratum*: Uncertain; geophyte; August; 3218BB
- A. henssenianum*: Uncertain; geophyte; August; 2817CD
- A. poeltianum*: Uncertain; geophyte; August; 2917DB, 3018DA
- A. scabromarginatum*: Uncertain; geophyte; September; 3018AC
- A. villosum*: Uncertain; geophyte; August; 3018DA
- A. vogelii*: Uncertain; geophyte; August; 2817CD
- Androsiphon capense* (Hyacinthaceae / Liliaceae): Critically Rare; geophyte; June-September; 3119AC/DA
- Anisodonteia alexandri* (Malvaceae): Extinct; shrublet; 3322CD/DC
- A. dissecta*: Vulnerable; perennial herb; September-October; 3319AC, 3320CC, 3419DB, 3420BC. Population status: numerous plants in a single hectare, possibly the only population. Threats: spread of alien vegetation.
- A. gracilis*: Uncertain; perennial herb; January; 3218AC, 3319DD
- A. pseudocapensis*: Uncertain; shrublet; October; 3320DC, 3321DC
- A. racemosa*: Uncertain; shrublet; November; 3218BB, 3219AA
- A. theronii*: Uncertain; shrub; August; 3321DA
- Antholyza namaquensis* (Iridaceae): Uncertain; geophyte; September-October; 2916BB/BD, 2917CA
- Apium inundatum* (Apiaceae / Umbelliferae): Indeterminate; aquatic herb; October-December; 3318CD, 3418BA
- Apodolirion bolusii* (Amaryllidaceae): Critically Rare; geophyte; December; 3224BC
- A. lanceolatum*: Uncertain; geophyte; January; 3320CC/CD, 3321AC, 3420BA, 3421AD. Population status: two populations: many plants were evident in a few-hectare area after a fire, while the other had only one plant. Threats: alien Acacias seem set to suppress all local vegetation in the area. Urgency for conservation: medium priority.
- Arctotheca forbesiana* (Asteraceae): Indeterminate; herb; July-October; 3218DB, 3318CD/DC, 3418AB/BB
- Arctotis aenea* (Asteraceae): Uncertain; herb; September-October; 3118DA, 3218DC, 3319CC
- A. crispata*: Uncertain; herb; October; 3017BB
- A. diffusa*: Uncertain; herb; August-October; 3119AC, 3123D, 3220BC/BD

- A. dregei:** Uncertain; herb; 3419BB
- A. fosteri:** Uncertain; perennial herb; August; 3218BB
- A. parviflora:** Uncertain; herb; September; 3319AB
- A. rosea:** Uncertain; herb; September-October; 3320CC
- A. sulcocarpa:** Uncertain; herb; August-October; 3119AC, 3220D
- Argyrobium aciculare (Fabaceae):** Uncertain; shrub; December; 3419AA
- A. brevicalyx:** Endangered; shrub; October; 3420AA. Population status: only one plant was discovered in 1983, in a narrow strip of renosterveld surrounded by wheatlands. It was subsequently found to be absent from other likely sites nearby. Urgency for conservation: high priority.
- A. connatum:** Critically Rare; shrub; September-October; 3321CD, 3421AB
- A. crinatum:** Uncertain; shrub; 3320DD
- A. muirii:** Uncertain; shrub; 3421AB
- Aristea biflora (Iridaceae):** Endangered; perennial herb; September; 3419BA. Seeds of this plant are being stored in the Bolus Herbarium seed-bank.
- A. lugens:** Vulnerable; perennial herb; August-October; 3318DB/DC/DD. Population status: seven populations were known previously, several of which are now evidently extirpated. The population studied covered a few hectares. Threats: ploughing and grazing. Cultivation: grown in the Durbanville Nature Reserve: a striking plant but with short-lived flowers. Urgency for conservation: high priority.
- A. palustris:** Uncertain; perennial herb; December; 3419DA/DB/DC
- A. recisa:** Uncertain; perennial herb; November-January; 3319DC, 3419AA
- A. simplex:** Uncertain; perennial herb; November-December; 3322DC, 3420BA
- A. singularis:** Critically Rare; perennial herb; July; 3219AA
- Askidiosperma longiflorum (Restionaceae):** (formerly *Chondropetalum longiflorum* Pillans, fide H.P. Linder, ined.); Vulnerable; tussock plant; August-December; 3319AD/CB
- Aspalathus acanthiloba (Fabaceae):** Uncertain; shrublet; October-November; 3418BB/BD
- A. acanthophylla:** Indeterminate; shrublet; October-February; 3318AB/BA/BC/CD/DA/DC
- A. aciloba:** Uncertain; shrublet; October-November; 3419DB, 3420CA/CC, 3421BC
- A. arenaria:** Critically Rare; shrub; August; 3421AD/BC. Population status: known from two areas, both with a few small populations with up to a few hundred plants. Threats: invasion by alien vegetation and housing development. Cultivation: good potential: seeds were given to Kirstenbosch. Urgency for conservation: high priority.
- A. barbigerata:** Endangered; shrub; October-November; 3420AD/BC
- A. bidouwensis:** Indeterminate; shrublet; November-December; 3219AB
- A. borbonifolia:** Critically Rare; shrublet; November-December; 3318CD
- A. bowieana:** Uncertain; shrub; September-November; 3322CD, 3422AB, 3423AA
- A. burchelliana:** Vulnerable; shrub; September-January; 3319DD, 3320CC, 3420AB/BC. There is a population of less than 100 plants in a one-hectare patch in the Bontebok Park.

- A. campestris*: Uncertain; shrublet; December, March; 3320CC, 3421BB
- A. candidula*: Uncertain; shrublet; October-November; 3421AC/AD
- A. compacta*: Uncertain; shrublet; October-November; 3319AB
- A. comptonii*: Critically Rare; shrublet; December; 3219AB
- A. concava*: Uncertain; shrublet; February; 3419AA
- A. corniculata*: Uncertain; shrublet; December-January; 3319AC
- A. decora*: Uncertain; shrub; November-December; 3218BD, 3219AC
- A. desertorum*: Critically Rare; shrub; October-December; 3219CD, 3319AB/AD/BC
- A. digitifolia*: Critically Rare; shrub; September; 3322CC
- A. erythrodes*: Uncertain; shrublet; November; 3319AC
- A. esterhuysenia*: Critically Rare; shrublet; December-January; 3319AA
- A. excelsa*: Critically Rare; October-November; 3419AC/AD
- A. fasciculata*: Critically Rare; shrub; November-January; 3319AA
- A. ferox*: Uncertain; shrub; October; 3319DC
- A. florulenta*: Uncertain; shrublet; 3119CA, 3219AA
- A. fourcadei*: Uncertain; shrub; September-November; 3323DA, 3324CC
- A. glabrata*: Indeterminate; shrublet; September-December; 3318AD
- A. globulosa*: Indeterminate; shrublet; November-December; 3318BA, 3418AB, 3420CA/BC
- A. glossoides*: Uncertain; shrublet; October-December; 3218DC
- A. grobleri*: Endangered; shrublet; March-April; 3420AB/BC. Population status: known from two sites, one of which is in the Bontebok Park with a number of scattered small populations. The other site at the De Hoop Nature Reserve had a few hundred plants in a less than 10 ha area. Urgency for conservation: high priority.
- A. hypnoides*: Uncertain; shrublet; December; 3320CD
- A. incana*: Uncertain; shrublet; 3321AD/AC
- A. karrooensis*: Uncertain; shrublet; May; 3321CB
- A. lamarckiana*: Uncertain; shrub; September-October; 3320BD, 3321AC/AD
- A. latifolia*: Uncertain; shrub; October-November; 3218DB/DC
- A. lenticula*: Uncertain; shrublet; December-January; 3319AC
- A. longifolia*: Uncertain; shrub; September-October; 3321CC
- A. macrantha*: Indeterminate; shrub; September-November; 3418AB/BB/BD, 3419DA
- A. macrocarpa*: Uncertain; shrublet; November-December; 3319DD, 3320CD
- A. obliqua*: Uncertain; shrublet; October-November; 3119AA
- A. obtusifolia*: Uncertain; shrublet; December-February; 3421BA/BB/BC, 3422AA

- A. odontoloba:** Uncertain; shrublet; January-February; 3421AB/BA
- A. oliveri:** Critically Rare; shrub; January; 3322AD
- A. orbiculata:** Uncertain; shrub; November-December; 3319BC
- A. pilantha:** Uncertain; shrublet; November; 3319BC
- A. prostrata:** Endangered; shrublet; December; 3420CA
- A. quadrata:** Uncertain; shrublet; May; 3421BA
- A. ramosissima:** Uncertain; shrub; November; 3321BD, 3322AC
- A. rectistyla:** Uncertain; shrublet; October; 3218DB/DD
- A. rosea:** Critically Rare; shrublet; August-September; 3419AC/AD/BD
- A. rostrata:** Uncertain; shrub; November; 3319DB
- A. rycroftii:** Endangered; shrublet; February-March; 3318BC
- A. smithii:** Vulnerable; shrublet; February-April; 3419AB/BD, 3420AC/AB/BC
- A. spectabilis:** Critically Rare; shrub; October-December; 3321CC, 3420AB, 3421BA
- A. stokoei:** Critically Rare; shrub; October-January; 3418BD, 3419AC
- A. suaveolens:** Critically Rare; shrublet; November-January; 3319AA
- A. sulphurea:** Uncertain; shrublet; October; 3319AA
- A. truncata:** Uncertain; shrub; November; 3319AC/CA
- A. vacciniifolia:** Uncertain; shrublet; November; 3418BB
- A. variegata:** Extinct; shrublet; November; 3318CD/DC
- A. venosa:** Critically Rare; shrub; October; 3118BC
- A. vulpina:** Uncertain; September-October; 3320DC, 3321CC, 3421A
- Asterochaete schlechteri (Cyperaceae):** Uncertain; perennial herb; December-January; 3319AB/AC
- Atalaya capensis (Sapindaceae):** Critically Rare; tree; December-February; 3324CA, 3325AD/C
- Athanasia capitata (Asteraceae):** Indeterminate; shrub; November-March; 3318BD/DA/DB/DD.
Population status: Cape Peninsula populations appear to have been extirpated by urban development; a remote northern population has not been re-discovered; a new population was found to have a few hundred plants in 11 ha area of disused ploughed lands. Threats: the area was badly grazed and trampled; roadside plants were being regularly mowed; and alien *Acacia* grows in a 1 km-long belt next to the population. Cultivation: unattractive, no potential for such usage. Urgency for conservation: maximum priority.
- A. crassifolia:** Uncertain; shrub; January; 3319BC/CB
- A. hameri:** Uncertain; shrub; December; 3319CC/CD, 3419BA. Population status: known from three areas, one of which had several thousand plants in four populations in a 1 ha patch. Threats: scattered Pines and *Hakea* plants could form thickets which could eventually endanger the population if not checked: the Pines are spreading from a nearby Forestry plantation. Urgency for conservation: minimum: occasional monitoring.
- A. mundtii:** Uncertain; shrub; December, June-July; 3325CC, 3419CB/DA, 3420AB

- A. palmitifida*: Uncertain; shrub; April; 3319BC
- A. quinquentata*: Uncertain; shrub; December; 3322CC
- A. rugulosa*: Vulnerable; shrub; October-November; 3318AB/BC/DA. Population status: known from three places, several thousand at a 50 ha area, smaller numbers at the other sites. Threats: alien acacias threaten all the populations, some with dense thickets nearby; agriculture is a threat in all but one site. Urgency for conservation: high priority.
- A. spatulata*: Uncertain; shrublet; January; 3319BC, 3318BC
- A. tomentella*: Uncertain; shrub; November-December; 2917B, 3118DC, 3219AA
- Audouinia capitata* (Bruniaceae): Vulnerable; shrub; May-August; 3418AB/AD, 3419AD. Population status: six populations, with one at 400 plants, two at 60, one each at 13, 3, 2 and 1 plant respectively, are currently known on the Cape Peninsula, mostly in a Divisional Council Nature Reserve; two populations 40 and 80 km to the east have not been rediscovered although in well-studied areas; a third, 90 km to the east has recently been rediscovered. One of the unprotected Peninsula populations has not been seen for many years and has probably succumbed to *Acacia* invasion; another (the largest) has *Acacia* thickets and Pine trees close to it. The plants regenerate very well after fires by re-sprouting from rootstocks. Cultivation: high potential as this is an attractive plant. It is also of high scientific value, being the only member of a primitive monotypic genus of an endemic Cape Family. Urgency for conservation: although the plant is relatively safe in the Nature Reserve, high priority should be given to ensuring its safety elsewhere in places where it has declined.
- Babiana auriculata* (Iridaceae): Critically Rare; geophyte; September; 3218BB, 3219AA
- B. brachystachys*: Uncertain; geophyte; September; 3017AD, 3218BB
- B. cedarbergensis*: Critically Rare; geophyte; September; 3219AC/C
- B. foliosa*: Uncertain; geophyte; August; 3419BB
- B. horizontalis*: Uncertain; geophyte; June; 2917AC/BA
- B. klaverensis*: Uncertain; geophyte; June-July; 3118DC
- B. leipoldtii*: Indeterminate; geophyte; August-September; 3318AD/DA
- B. lobata*: Uncertain; geophyte; July-August; 2817AC, 3017DB, 3018CA
- B. obliqua*: Uncertain; geophyte; July; 3217DB/, 3218AB/BB/CD, 3318AD
- B. pauciflora*: Uncertain; geophyte; June; 3119AC/CB
- B. pilosa*: Uncertain; geophyte; August; 3118AA/AD
- B. salteri*: Critically Rare; geophyte; June-July; 3118BD
- B. stenomera*: Critically Rare; geophyte; August; 3118AB/BA/CB
- B. striata* var *planifolia*: Critically Rare; geophyte; June-July; 2917BA
- B. torta*: Uncertain; geophyte; May; 3018DB
- B. virginea*: Uncertain; geophyte; September; 3120CC
- Berkheya angusta* (Asteraceae): Uncertain; shrub; December; 3419BC
- B. dregei*: Critically Rare; shrub; January-July; 3218BB, 3219AA/AC. Population status: one known locality in a well-studied region, with 20 plants in a 1 ha area. There are no evident threats and the area is well-buffered by fynbos.

- B. francisci**: Critically Rare; shrub; November-January; 3322AC/AD
- Berrisfordia khamiesbergensis** (Mesembryanthemaceae): Indeterminate; succulent; August-October; 3018AC
- Berzelia dregeana**: Critically Rare; shrub; July-January; 3418BD
- B. ecklonii**: Critically Rare; shrub; August-January; 3418BB/BD, 3419AC. Population status: scattered plants in at least two small populations in a limited area. Threats: the area is frequently visited by commercial flower-pickers. Cultivation: a plant of potential interest for cultivation although it requires a marshy soil. Urgency for conservation: low, except that flower-picking should be checked.
- Blepharis inermis** (Acanthaceae): Uncertain; shrub; October; 3321AD/AC
- Bobartia fasciculata** (Iridaceae): Uncertain; tussock plant; August-November; 3218DB
- B. gladiata ssp major**: Critically Rare; tussock plant; November-December; 3418AD. Population status: three scattered populations each with about a hundred plants, in a Divisional Council Nature Reserve. A potential threat in some areas of invasion by *Acacia cyclops* is being vigorously combatted by the Reserve staff.
- B. lilacina**: Critically Rare; tussock plant; January-March; 3319CA/CC
- B. longicyma ssp longicyma**: Uncertain; tussock plant; August-October; 3419AB/BD
- B. macrocarpa**: Uncertain; tussock plant; August-February; 3325
- B. macrospatha ssp anceps**: Critically Rare; tussock plant; May-June; 3321CC
- B. orientalis ssp occidentalis**: Critically Rare; tussock plant; September-November; 3218DB/DC
- B. paniculata**: Critically Rare; tussock plant; November-February; 3322DB
- B. parva**: Endangered; tussock plant; November-February; 3320CD/DC/DD. Population status: known from three places in a 40 km-long range, at one consisting of about 50 plants on a 1 km-long ridge. Threats: small population-size coupled with the effects of fire. The other two sites still have to be investigated. Urgency for conservation: low priority at present.
- B. robusta**: Critically Rare; tussock plant; August-October; 3322CC, 3421BA, 3422AA
- Boophane pulchra** (Amaryllidaceae): Critically Rare; geophyte; May; 3017BD
- Brachycorythis macowaniana** (Orchidaceae): Critically Rare; geophyte; October-March; 3322CC, 3323CD/DC/DD, 3424AB
- Brachymeris erubescens** (Asteraceae): Uncertain; shrub; January, July; 3225BC, 3320DC
- Brachysiphon mundii** (Penaecaceae): Critically Rare; shrublet, a long-lived sprouter; September-October, April; 3420AD. Population status: restricted to exposed limestone cliffs in a 10 000 ha area, the total estimated to be a few thousand plants. The plants are vigorous and not threatened. The site is in a Provincial Nature Reserve.
- B. rupestris**: Critically Rare; shrublet; October, November, March; 3419AC/AD
- Brachystelma occidentale** (Asclepiadaceae): Indeterminate; perennial herb; 3418AD
- Brunia macrocephala** (Bruniaceae): Critically Rare; shrub; 3319BC/CB/DA
- Brunsvigia litoralis** (Amaryllidaceae): Vulnerable; geophyte; 3424BB
- B. herrei**: Critically Rare; geophyte; 2917BB/D
- B. minor**: Critically Rare; geophyte; 3118DC; 3119AC.

- Bulbine brunsvigiaefola** (Asphodelaceae / Liliaceae): Uncertain; succulent geophyte; September; 3017DB, 3018CD
- B. flexicaulis**: Uncertain; geophyte; 3325CD/DC
- B. minima**: Uncertain; geophyte; September-February; 3118DC, 3318CD, 3319AC, 3421AB
- B. urgineoides**: Uncertain; geophyte; March, September; 3017DB, 3219AC
- Cadiscus aquaticus** (Asteraceae): Endangered; aquatic herb; August-October; 3318AB/BB/DA. Population status: dense populations in widely dispersed pools in wheatlands. Threats: drainage and ploughing up of pools; massive increases in salinity due to leached fertilizers; destruction by herbicides. The plant is of scientific interest. Urgency for conservation: medium priority.
- Calliandra redacta** (Fabaceae): Critically Rare; shrub; 2817CB
- Calopsis impolitus** (Restionaceae): (*Leptocarpus impolitus*, fide H.P. Linder, ined.); Vulnerable; tussock herb; June-July; 3118DC, 3318AB/BC/DA/DC, 3419DB. Population status: known from a few places in a 150 km-long range mainly in the coastal lowlands where there are widespread areas of replacement of natural vegetation by ploughed lands. At one site three populations of several thousand plants were threatened by agriculture and alien *Acacia* infestations. Urgency for conservation: medium priority.
- C. levynsiae**: (*Leptocarpus levynsiae*, fide H.P. Linder, ined.); Critically Rare; tussock plant; September; 3219CD/DC
- C. monostylis**: (*Leptocarpus monostylis*, fide H.P. Linder, ined.); Indeterminate; tussock plant; April-October; 3320CD/DD, 3321CC/CD
- C. rigoratus var simulans**: (*Leptocarpus rigoratus var simulans*, fide H.P. Linder, ined.); Vulnerable; tussock herb; September; 3318BC/DA/DC, 3418BA, 3419AA/DD. Population status: known from several disjunct sites in two zones 200 km apart in the coastal lowlands, where there are widespread areas of replacement of natural vegetation by ploughed lands. Three populations studied had several thousand plants in each. Threats: agriculture, alien acacias, land development. Urgency for conservation: low priority.
- Cannomois aristata** (Restionaceae): Critically Rare; tussock plant; August; 3219AA
- Caralluma aperta** (Asclepiadaceae): Uncertain; succulent; March, July; 2817AC, 2916BD, 2917BD/DB/DC, 3017AD
- C. arenicola**: Extinct; succulent; March-May; 2922DC, 3222AB, 3320CC, 3322AB/CA, 3323AB
- C. arida**: Uncertain; succulent; 3321, 3421
- C. bredae var bredae**: Critically Rare; succulent; 3223CC
- C. bredae var thomallae**: Indeterminate; succulent; 3225BC
- C. cincta**: Vulnerable; succulent; January; 3118BC, 3319CB
- C. gracilis**: Uncertain; succulent; 3118DA, 3119BD/DB/DD, 3219AA/AB
- C. intermedia**: Indeterminate; succulent; 3218DB
- C. inversa**: Indeterminate; succulent; January; 3118DA, 3218BB
- C. linearis**: Critically Rare; succulent; November-December; 3320BA/BB, 3321AD
- C. longipes**: Indeterminate; succulent; January-February; 3019CD, 3319DB, 3320CA/CC
- C. maughanii**: Critically Rare; succulent; January, July; 3119AA/AC/AD/CB

- C. parviflora:** Indeterminate; succulent; December; 2917BA/BC
- C. pillansii:** Indeterminate; succulent; 3319DA, 3320CC, 3323AD
- C. pruinosa:** Indeterminate; succulent; January, July; 2916BD, 2917DC, 3017BB
- C. umdausensis:** Indeterminate; succulent; July; 2917BA/BB/BC
- C. villetii:** Critically Rare; succulent; May-July; 3118AB/DA
- Carpobrotus fourcadei var alba (Mesembryanthemaceae):** Critically Rare; succulent; August-December; 3323DD, 3421AD
- Caryotophora skiatophytoides (Mesembryanthemaceae):** Critically Rare; perennial herb (slightly succulent); September-November; 3419DB/DD, 3420CA. Population status: two populations are known, a few kilometres apart: more may be found as the area is relatively unexplored. One population had 30 scattered plants in 1 ha, the other about 50 in 200 m² and less vigorous. Threats: Acacia cyclops is invading the smaller population. Urgency for conservation: low priority.
- Cephalophyllum anemoniflorum (Mesembryanthemaceae):** Indeterminate; succulent; August-September; 3418BA/BB, 3419AC
- Ceratocaryum fistulosum (Restionaceae):** (*Willdenowia fistulosa*, fide H.P. Linder, ined.); Indeterminate; tussock herb; February-April; 3320CD, 3321CD, 3418BD
- Ceropegia connivens (Asclepiadaceae):** Uncertain; perennial herb; September; 3319DA
- Charadrophila capensis (Gesneriaceae):** Vulnerable; herb; September-November; 3318DD, 3418BD. Population status: known in two places 40 km apart in a well-studied region. At one, there are about 25 plants on a 20 m² cliff-face; the plants were vigorous in a specialized habitat, protected in a State Forest. Threats: possible damage by unscrupulous plant-collectors; natural loss of substrate through subsidence. The plant is of scientific and horticultural interest. Urgency for conservation: medium priority.
- Chasmanthe bicolor (Iridaceae):** Uncertain; geophyte; May-June; 3319CC/DD, 3419AB
- Chasmatophyllum maninum (Mesembryanthemaceae):** Uncertain; succulent; September-October; 3124C, 3224DA, 3324AB
- Cheilanthes depauperata (Adiantaceae):** Uncertain; fern; July-December; 3320AC/BA, 3219AA
- Chlorophytum lewisae (Asphodelaceae / Liliaceae):** Uncertain; geophyte; September; 3119CD
- C. monophyllum:** Uncertain; geophyte; December; 3319AB
- Chondropetalum acockii (Restionaceae):** Endangered; tussock herb; April-May; 3318BC/DA/DC. Population status: four widely scattered populations each with several hundred plants in a few hectares. Threats of infestation by alien vegetation, ploughing and land development are serious at every site. One is in a badly alien-infested Nature Reserve which is being considered for abolition by a local authority. Many other plants in the coastal lowland area where this plant occurs are in similar difficulties. Urgency for conservation: maximum priority.
- C. rectum:** Vulnerable; tussock herb; October-November; 3418BA/BB, 3419AA/AB/DB. Population status: formerly widespread and now confined to about five populations with several thousand plants in each. All populations are threatened by invading thickets of alien acacias; agricultural and industrial development are also serious threats. Urgency for conservation: medium priority.
- Chrysanthemum decurrens (Asteraceae):** Uncertain; herb; August; 2916BD, 2917AA/BA
- Cliffortia acockii (Rosaceae):** Vulnerable; shrub; October-November; 3318DA/DD
- C. aculeata:** Critically Rare; shrub; November-January; 3322AC

- C. acutifolia*: Indeterminate; shrub; August-December; 3119AC. Population status: two known populations of undetermined size, in a limited area: the plants are very thinly dispersed and could extend elsewhere. No threats have been recorded, and the plant will probably be categorized as Critically Rare.
- C. arborea*: Critically Rare; shrub; November; 3119BC/DD, 3220BC, 3222BC
- C. carinata*: Uncertain; shrub; January-April; 3418AB, 3419AA
- C. crenulata*: Uncertain; shrub; October; 3419AB/AD
- C. curvifolia*: Uncertain; shrub; July; 3419DB
- C. cymbifolia*: Uncertain; shrub; September-December; 3319AA/CC, 3322AC, 3418AD. Population status: known from only four disjunct collectings up to 300 km apart; at one, several thousand plants occupied an area of about 1 ha in a Divisional Council Nature Reserve.
- C. geniculata*: Indeterminate; shrub; February; 3419AC
- C. intermedia*: Uncertain; shrub; August-December; 3318CD, 3319CA, 3418AB, 3419BA
- C. lanata*: Uncertain; shrub; June; 3319CB
- C. longifolia*: Uncertain; shrub; December; 3418A/BA, 3420
- C. monophylla*: Uncertain; shrub; 3419AA/AB/BB/BC
- C. montana*: Uncertain; shrub; December-January; 3224AA, 3322AC
- C. multiformis*: Uncertain; shrub; January-April; 3319CA, 3419AC/AD
- C. reticulata*: Uncertain; shrub; September-February; 3319AA/AC, 3418BB
- C. strigosa*: Indeterminate; shrub; March, October; 3319CA
- Coleonema pulchrum*: Critically Rare; shrub; August-October; 3320DC
- C. virgatum*: Critically Rare; shrub; August-October; 3320CD, 3321CC
- Conophytum edwardsiae* (Mesembryanthemaceae): Indeterminate; succulent; March-June; 3219CB
- C. luekhoffii*: Indeterminate; succulent; April-May; 3119AC, 3218BB/DC, 3219CA/CC
- C. turrigerum*: Indeterminate; succulent; July-October; 3218DB, 3318BC/BD/DB
- Corycium bifidum* (Orchidaceae): Indeterminate; geophyte; November-January; 3418AB/BD, 3419AB
- C. deflexum*: Uncertain; geophyte; October; 3219AA/AC/AD, 3220BC, 3319AD
- C. excisum*: Critically Rare; geophyte; October-November; 3218BB, 3318BC/CD/DA, 3319AB, 3418AB/AD/DA/DB
- C. microglossum*: Vulnerable; geophyte; October-November; 3318DA/BC/DC, 3319AC/AD, 3418AB. Population status: known from six disjunct sites up to 50 km apart, some of which have been so changed that the plant would have long ago been locally extirpated; at one site there were about 25 plants in an area of 0,25 ha, apparently only flowering after a fire. Threats at this site were from alien vegetation (*Eucalyptus* and *Pinus*) and grazing, both being controlled by the conservationist land-owner. At another site there were about 30 plants in a 200 m² area, threatened by alien *Acacia* infestation and grazing by sheep. The plant is of scientific interest. Urgency for conservation: maximum priority: research is needed on how to conserve ground-orchids which are as rare as this species.
- C. rubiginosum*: Critically Rare; geophyte; October-January (after fire); 3318DD, 3319CD, 3418AB, 3419AC/AD

- Corymbium salteri* (Asteraceae): Indeterminate; herb; December; 3418BB
- C. theileri*: Indeterminate; herb; January; 3218
- Cotula duckittiae* (Asteraceae): Indeterminate; annual herb; September; 3318AD/CB/DD
- C. loganii*: Uncertain; herb; October; 3119AA
- C. myriophylloides*: Indeterminate; herb; October; 3318CD, 3418AB
- C. paradoxa*: Uncertain; herb; July, October-November; 3418BB
- C. pedunculata*: Uncertain; annual herb; August; 3218BB
- Crassula alcornis* (Crassulaceae): Extinct; succulent; May-July; 3219CC
- C. alpestris ssp massonii*: Uncertain; succulent herb; October-November; 3118DA, 3119CD, 3320BA
- C. arborescens ssp undulatifolia*: Critically Rare; succulent shrub; December-January; 3325AC
- C. barbata ssp broomii*: Critically Rare; succulent; October-November; 3122BA, 3123AC
- C. brachystachya*: Uncertain; succulent; November-January; 3320BD, 3321BC, 3322AA
- C. elsiae*: Critically Rare; succulent; November-December; 3219AA. Population status: known from only two mountains, with numerous small colonies of individuals scattered over a summit area. Urgency for conservation: low priority.
- C. fusca*: Critically Rare; succulent; November-December; 2816BB/BD, 2917BA
- C. multiceps*: Critically Rare; succulent; May-June; 3018CD, 3118AA
- C. multiflora ssp leucantha*: Uncertain; shrublet; February; 3419AA
- C. namaquensis ssp comptonii*: Critically Rare; succulent; September-October; 3119AC, 3219CD
- C. namaquensis ssp lutea*: Uncertain; succulent; October-November; 3219BA/CD, 3319AD
- C. obovata var dregeana*: Uncertain; succulent; April-June; 3030CB, 3130AA
- C. pellucida ssp spongiosa*: Critically Rare; herb; October-November; 3119AC
- C. roggeveldii*: Critically Rare; herb; September-October; 3320AB/AD
- C. rupestris ssp marnierana*: Uncertain; succulent shrublet; April-June; 3320DA/DB, 3321BA/BC
- C. sericea var velutina*: Uncertain; succulent; September-November; 2816BB/BD
- C. socialis*: Critically Rare; succulent; August-October; 3118DC, 3320BB, 3325BB
- C. streyi*: Uncertain; succulent; May-June; 3130AA
- C. subulata var hispida*: Extinct; shrub; November-December; 3320CA
- C. susannae*: Indeterminate; succulent; April-May; 3017AB
- C. vestita*: Critically Rare; perennial herb; October-November; 3119DD, 3220DA
- Crocsmia fucata* (Iridaceae): Uncertain; geophyte; November-December; 3018AC
- Crotalaria lebeckioides* (Fabaceae): Uncertain; shrub; May; 3320BC
- Cryptadenia laxa* (Thymelaeaceae): Uncertain; shrublet; October-December; 3419AA/BA/BB

- Cryptocarya angustifolia* (Lauraceae): Uncertain; shrub/tree; November; 3319AD/CC/DA, 3320DC
- Cullumia floccosa* (Asteraceae): Uncertain; shrub; October-January; 3218AD/BB/DA/DB
- C. micrantha*: Uncertain; shrub; October-January; 3218BC/DA
- C. pectinata*: Critically Rare; shrub; August-November; 3119AA/AC
- C. selago*: Uncertain; shrub; December; 3419AB
- Cyclopia bowieana* (Fabaceae): Indeterminate; shrub; September; 3320DD, 3322CD
- C. burtonii*: Indeterminate; shrub; December-January; 3322AC, 3323AD
- C. filiformis*: Uncertain; shrub; 3325CC
- C. longifolia*: Uncertain; shrub; January; 3325CC
- C. pubescens*: Uncertain; shrub; August-September; 3325CC/DC
- Cyphia comptonii* (Campanulaceae): Uncertain; perennial herb; July-August; 3219BA/BD
- C. dentariaefolia*: Uncertain; climber; July-September; 3218CD, 3219AA, 3418AB, 3421BC
- C. longiflora*: Uncertain; climber; July; 3118AB
- C. longilobata*: Uncertain; climber; April; 3322CA
- C. oligotricha*: Uncertain; perennial herb; July; 3118AA
- C. ranunculifolia*: Critically Rare; climber; September; 3219AA. Population status: known from only one area in which the plants were difficult to find: only three were located in 2 ha: possibly more would be seen when the plants are in full flower. There appear to be no threats: the site is in a Forestry Wilderness Area.
- C. salteri*: Uncertain; climber; July; 3118BD/DB
- C. stephensi*: Uncertain; perennial herb; September; 3219CA
- C. tortilis*: Uncertain; climber; June; 3422BB
- Cyrtanthus carneus* (Amaryllidaceae): Vulnerable; geophyte; December-February; 3318DC; 3322CC; 3419AC/DA; 3420BC/BD/CA
- C. guthrieae*: Vulnerable; geophyte; March-April; 3420CA, 3419DB
- C. herrei*: Critically Rare; geophyte; May; 2917DC
- C. odorus*: Vulnerable; geophyte; March-April; 3320CD/DC
- C. spiralis*: Vulnerable; geophyte; January-March; 3425BA; 3325CD/DC/DD. Population status: previously known from six localities at some of which the plant is unlikely to remain due to heavy threats from peri-urban development. At one locality a small population was surviving as scattered individuals in highly degraded and over-grazed veld which had a pasture-like appearance. Further study is needed in the region to establish the precise status of this very attractive plant which would be a fine subject for horticulture. Urgency for conservation: medium priority.
- C. staadensis*: Vulnerable; geophyte; March; 3326BC, 3325CC/CD/DC
- Daubenya aurea* (Hyacinthaceae / Liliaceae): Uncertain; geophyte; September; 3220AB/BC
- D. aurea var coccinea*: Endangered; geophyte; August; 3220AB

- Delosperma macrostigma** (Mesembryanthemaceae): Uncertain; succulent herb; January-April; 3320DC
- D. mariae**: Uncertain; succulent herb; April; 3420AD
- Diascia dielsiana** (Scrophulariaceae): Uncertain; annual herb; May; 3421AB
- D. dissecta**: Uncertain; annual herb; 3119DD
- D. heterandra**: Indeterminate; annual herb; 3318DC
- D. nana**: Uncertain; annual herb; July-September; 3119BC/BD, 3120CC, 3319CB
- D. nutans**: Uncertain; annual herb; 3119BC/BD
- D. pentheri**: Uncertain; herb; 3322CD
- D. ramosa**: Uncertain; perennial herb; March; 3225DA
- D. rudolphi**: Uncertain; annual herb; August; 3118D, 3218BD
- D. scullyi**: Uncertain; annual herb; 3118
- Diastella buekii** (Proteaceae): Endangered; shrub; September-November; 3318DD, 3319CC. History: used to be distributed over an extensive area. Population status: now confined to three populations, of which one has about 2 500 plants in 78 ha and another, 30 in a few hundred m². Both populations are under the control of Forestry conservationists. Cultivation: Kirstenbosch has 8 plants rooted from cuttings. The plant would be a fine subject for horticulture, forming a vivid green carpet with pale pink inflorescences. Urgency for conservation: maximum priority.
- D. myrtifolia**: Critically Rare; shrub; December; 3319AC. Population status: Previously only known from four places: currently only at three. One population had 300 plants in 400 m² in a Forestry-managed area. Possible future threats requiring monitoring: *Hakea* and *Pinus* could infest the population and there is a risk of the site being afforested with an extension of the nearby plantations; there is also a long-term risk of development of a large dam project in the region.
- D. parilis**: Vulnerable; shrub; July-January; 3319AC/CA/CB. Population status: previously known from several places, at two of which the plant has become extirpated. At another there were between 300 and 400 plants in an area of 1 ha, forming a belt next to a vineyard. Threats: at the time of the survey, December 1979, the area was destined to be ploughed in five years' time for making a vineyard. The site is being invaded by *Hakea* from the slopes above. Further study: the area should be searched for the other populations and adequate measures such as a nature reserve set in hand. Urgency for conservation: high priority.
- D. proteoides**: Vulnerable; shrub; July-February; 3318BC/CD/DA/DC/DD. Population status: previously known from a 60 km-long distribution area, now extirpated in many former sites; still exists in numerous populations but which are threatened by agriculture, invasive plants and urban development. At one site a population of a few thousand individuals was threatened by ploughing and infestation from nearby dense stands of alien Acacias. Cultivation: grown at Kirstenbosch: the plant is attractive and is likely to be of value in horticulture in exposed, deep, dry sands. Urgency for conservation: high priority.
- Diclis stellarioides** (Scrophulariaceae): Indeterminate; annual herb; October; 3319
- Didymaotus lapidiformis** (Mesembryanthemaceae): Vulnerable; succulent; October; 3219DD, 3319BB/BC
- Diosma arenicola** (Rutaceae): Uncertain; shrub; all year; 3419DA/DB/DD, 3420CA/CC
- D. aristata**: Endangered; shrub; February, May, October; 3422AA
- D. aspalathoides**: shrub; July-October; 3318AA/AC/AD/CB/DC
- D. dichotoma**: Vulnerable; shrub; September-January; 3318AB/AC/AD/BC/CB/CD/DC

- D. fallax*: Uncertain; shrub; September; 3420AA
- D. haelkraalensis*: Critically Rare; shrub; April; 3419DA, 3420CC
- D. parvula*: Endangered; shrub; flowers all year; 3419DB, 3420BC/BD. Population status: previously known from three areas, at two of which it has been extirpated by farming and invasive alien plants; currently known from four small sites, the largest population having a few thousand plants in a few hectares. Three of the sites are in small marshes in a valley, a kind of habitat which is widely threatened. Threats to at one population are browsing and trampling by livestock. Urgency for conservation: high priority.
- D. passerinoides*: Critically Rare; shrub; August-April; 3224CD, 3320BC/CA, 3322BC/DD/DB, 3419AB/BA, 3420AB/BD/CA, 3421AB. Population status: Known from several widely disjunct sites up to 90 km apart. In one site about 100 plants occupied an area of about 1 ha, with large stands of Eucalyptus nearby, in a Provincial Nature Reserve. Urgency for conservation: medium priority.
- D. pedicellata*: Uncertain; shrub; all year; 3119AC, 3218BB/CB/DC, 3219CA, 3318AD/BC/BD/DA/DC/DD, 3319AC/CA/CC/DC, 3418B. Population status: present distribution not certain but likely to be much reduced. At one population there were a few hundred plants in several hectares. Urgency for conservation: low priority.
- D. strumosa*: Indeterminate; shrub; June-July; 3320DC
- D. tenella*: Critically Rare; shrub; April; 3321CC, 3419DB, 3420BC/BD/CB. Population status: known from four sites. At one there were numerous plants confined to a single hectare. Threats at this site included grazing and invasion by alien Acacia and Eucalyptus. Urgency for conservation: medium priority.
- D. thyrsophora*: Uncertain; shrub; February-March, October; 3319DC, 3321BD, 3419BB
- Disparago rosea* (Asteraceae): Uncertain; shrub; October; 3323AD/CA
- Diplosoma leipoldtii* (Mesembryanthemaceae): Indeterminate; succulent; September; 3218DB
- D. retroversum*: Endangered; succulent; 3218AD/BC/DB
- Disa arida* (Orchidaceae): Vulnerable; geophyte; March-April; 3321DA, 3322CC
- D. begleyi*: Uncertain; geophyte; December-January; 3318DD, 3419AA
- D. bodkini*: Critically Rare; geophyte; October-November; 3318CD, 3322CC, 3419BB
- D. brachyceras*: Uncertain; geophyte; August-October; 3418BB/BD, 3419AA/AC/AD/BC
- D. cardinalis*: Critically Rare; geophyte; October-December; 3320DC, 3321CC. Population status: known from a few places in a 90 km range. Cultivation: high potential. The plant is already well established in private collections. Threats: fire and damage by unscrupulous collectors.
- D. falcata*: Uncertain; geophyte; 3421AB
- D. hallackii*: Endangered; geophyte; October-November; 3318DC, 3418BA/BB, 3421BA
- D. longifolia*: Critically Rare; geophyte; October; 3218D, 3319AD/BD, 3419AA
- D. marlothii*: Critically Rare; geophyte; December-January; 3219AD/CB, 3319BC, 3323DD
- D. minor*: Critically Rare; geophyte; November-December; 3319AC/AD/BC, 3419BA
- D. neglecta*: Critically Rare; geophyte; November-December; 3319AC
- D. ovalifolia*: Critically Rare; geophyte; September-October; 3219AA/AC/CA, 3318AD, 3319AB
- D. pillansii*: Critically Rare; geophyte; October-December; 3418BB/BD, 3419AA

- D. salteri**: Critically Rare; geophyte; April-May; 3219AC, 3321AD, 3322DC, 3418AD.
- D. schlechteriana**: Critically Rare; geophyte; December; 3321CC, 3322AA
- D. tabularis**: Critically Rare; geophyte; November-December; 3318CD, 3319CC
- D. tenuis**: (= *Amphigena leptostachya*): Critically Rare; geophyte; March-May; 3318DD, 3319CC, 3418AB/AD/BD, 3419AA
- Disperis bodkini** (Orchidaceae): Critically Rare; geophyte; July-September; 3318CD, 3319AD
- D. macrocorys**: Critically Rare; geophyte; September-October; 3119AC?, 3219AA/AC. Population status: known from three disjunct sites up to 100 km apart. At one site, scattered plants were confined to 0,5 ha in a Forestry-managed area.
- Dorotheanthus apetalus** (Mesembryanthemaceae): Uncertain; annual herb; September-October; 3218CD, 3318CD, 3418AB
- D. bidouwensis**: Indeterminate; annual herb; August; 3219AB
- D. booyensii**: Indeterminate; annual herb; September; 3220AD
- Drimia minor** (Hyacinthaceae / Liliaceae): Critically Rare; geophyte; February-April; 3318CD/DD, 3418AB, 3419BA
- Drosera regia** (Droseraceae): Critically Rare; herb; January-February; 3319CA
- Duvalia maculata** (Asclepiadaceae): Indeterminate; succulent; March-May; 2922DA, 3224AC
- D. parviflora**: Indeterminate; succulent; November-January; 3320BA/BB, 3321AD
- Dymondia margaretae** (Asteraceae): Critically Rare; shrub; September-October; 3420AD/BC/BD/CA/CB. Population status: a few populations are known in wetland areas in a narrow coastal strip, varying from 20 to several thousand individuals.
- Echidnopsis columnaris** (Asclepiadaceae): Vulnerable; succulent; 2816BB
- E. framesii**: Critically Rare; succulent; 3118BC/BD/DA, 3119AA
- Echiostachys spicatus** (Boraginaceae): Critically Rare; perennial herb; September-October; 3218CC, 3317BB, 3318AB/DD
- Elegia altigena** (Restionaceae): Uncertain; tussock herb; November; 3322DB
- E. extensa**: Indeterminate; tussock herb; October-December; 3319AC. Population status: known from one site, formerly from another where it has evidently been extirpated; may also occur at two disjunct sites; at the known locality the population consists of several thousand plants in a 5 ha area under a Forestry plantation of *Eucalyptus* trees where it is still surprisingly vigorous with no signs of senescence. When the *Eucalyptus* timber is removed, trampling will be a threat to the plant. Urgency for conservation: medium priority.
- E. fenestrata**: Vulnerable; tussock herb; June-November; 3418AD, 3419CB/DA/DB. Population status: known from four disjunct sites up to 100 km apart. At one the plant occurs in numerous populations in a Divisional Council Nature Reserve; at another the plant is confined to 600 m² and is under threat by *Acacia* infestation, disturbance by farming especially trampling by sheep; at another the plant is in a small marsh threatened by *Acacia* infestation; at another 40 km away from the nearest there are less than ten clumps. For the purpose of maintaining these scientifically interesting disjunctions, these populations should be conserved. Urgency for conservation: medium priority.
- E. prominens**: Vulnerable; tussock herb; August; 3418BA/BD/DC, 3419DB, 3420CC. Population status: known as a rare and extremely localised plant in about five populations in widely scattered places, with several thousand plants confined to very small areas in each. All the localities are highly threatened by alien *Acacia* infestation and many by agriculture. Urgency for conservation: high priority, especially for creation of nature reserves in the coastal lowlands where this and many other plants are threatened.

- E. stokoei*: Vulnerable; tussock herb; July-August; 3319AC/CD
- E. verreauxii*: Vulnerable; tussock herb; June-July; 3318AB/BC/CD/DC, 3418AB/AD/BB, 3419DB/DC/DD. Population status: known from seven populations, in three disjunct sites 80 and 130 km apart, with up to several thousand plants in each population. At one site there is a small population in a Divisional Council Nature Reserve; at all other sites the plant is heavily threatened by invasive alien Acacias. The plant favours seepage zones and is threatened by habitat change due to drainage for agriculture. The disjunct populations are of scientific interest. Urgency for conservation: high priority.
- Elytropappus hispidus* (Asteraceae): Critically Rare; shrub; September; 3118DC
- Empleurum fragrans* (Rutaceae): Critically Rare; shrub; September-February; 3320DD, 3420BB. Population status: known from three small places in a 5 km long range; at one site about a thousand plants were growing in a 100 m-long marsh. Because the plant is so restricted in area it should be regularly monitored in case a change in habitat causes a decline: at present the plant is well-buffered by natural vegetation in a Forestry catchment.
- Encephalartos caffer* (Zamiaceae): Vulnerable; cycad; 3424
- E. cycadifolius*: Vulnerable; cycad; 3225
- E. horridus*: Vulnerable; cycad; 3325
- E. lehmannii*: Critically Rare; cycad; 3224, 3225, 3323, 3324
- E. longifolius*: Vulnerable; cycad; 3224, 3323, 3324, 3325, 3424
- Endonema lateriflora* (Penaeaceae): Critically Rare; shrub; January-April; 3419BA
- E. retzioides*: Vulnerable; shrub; January-February; 3419AB/BB. Population status: known from a few places in a 40 km-long range; at one, seven plants were growing in a small patch where it is threatened by invasive Pine and Hakea infestations. The seed-pods are attacked by insects. Over-frequent veld-burning may affect the plant which depends on seed-production for survival of fires. Cultivation: unusual and attractive flowers make this plant a good candidate for horticulture. The plant is of scientific interest as a localized member of an endemic Cape Family. Urgency for conservation: high priority.
- Eremia brevifolia* (Ericaceae): Critically Rare; shrub; October-November; 3321DD, 3322CC
- Eremiella outeniquae* (Ericaceae): Critically Rare; shrub; October-January; 3322CC/CD
- Erica abelii* (Ericaceae): Vulnerable; shrub; October-February; 3325CB. Population status: known from only one locality where several sub-populations remain on rocky outcrops which protect them against frequent veld fires.
- E. acockii*: Extinct; shrub; April; 3318DC
- E. aghillana*: Vulnerable; shrub; April-May; 3419DB/DD, 3420CC
- E. alfredii*: Critically Rare; shrublet; January-April; 3419BA/BB
- E. amoena*: Critically Rare; shrub; October-April; Cape Peninsula
- E. aneimensa*: Vulnerable; shrub; August-December; 3322CC/CD/DC. Population status: known from four localities in a 35 km long range. Most of its habitat has been destroyed by afforestation and urbanization. Urgency for conservation: medium priority. The populations should be monitored periodically.
- E. annectens*: Critically Rare; shrub; January-March; 3418AB. Population status: known from three areas on the Cape Peninsula in which four populations have been studied, carrying in all several thousand plants. The habitat, on and below damp cliff-faces, makes this plant relatively safe from most of the usual pressures in the region of over-frequent fires, alien plant invasion and illegal flower-picking. Cultivation: should be investigated as the plant is showy and attractive.

- E. aspalathoides*: Uncertain; shrublet; September-December; 3218AC, 3219CA
- E. atrovinosa*: Endangered; shrublet; December-February; 3319AD.
- E. auriculata*: Uncertain; shrub; January; 3319AB
- E. bakeri*: Endangered; shrublet; August-September; 3319CC. Population status: confined to a single marsh in a well-studied region, where it occurs scattered through an area of about 2 ha. The population has been threatened in the past by alien plants which are being systematically controlled in a joint Forestry and Divisional Council programme. Other threats are trampling, drainage of the area's high water-table, removal of sand, and genetic decline due to the small size of the population. Provincial Nature Conservation has granted R4 000 to the conservation of this plant and *Erica chrysocodon* at another site (see below). Urgency for conservation: high priority, both for current management and for creation of a nature reserve at the site.
- E. barrydalensis*: Uncertain; shrub; August-September; 3320DC/DD
- E. beatricis*: Critically Rare; shrub; January; 3323DC
- E. berzelioides*: Uncertain; shrub; April; 3419DB
- E. blancheana*: Critically Rare; shrub; March-July; 3418AD
- E. blesbergensis*: Critically Rare; shrub; October; 3322BC
- E. bolusiae*: Endangered; shrub; March-June; until recently thought to be Extinct, but now known from a Forest Reserve; 3318DC/DD; high priority.
- E. brachycentra*: Indeterminate; shrub; February-April; 3322CC/CD/DC
- E. cabernetii*: Endangered; shrub; 3418BB
- E. caledonica*: Critically Rare; shrub; February; 3419BA/CB
- E. capensis*: Critically Rare; shrub; January-February; 3418AD
- E. capitata*: Critically Rare; shrub; October-November; 3418AD
- E. casta*: Vulnerable; shrub; July-January; 3419DA/DB, 3420BC
- E. cerviciflora*: Uncertain; shrub; 3418BB
- E. chlorosepala*: Critically Rare; shrub; March; 3320DC/DD, 3321CD, 3420AB, 3421AB
- E. clavisepala*: Critically Rare; shrub; February-April; 3418AB/AD
- E. chrysocodon*: Endangered; shrub; August-October; 3319CC. Population status: known from a single population of a few hundred plants in an area of less than 1 ha. The plants seem to be vigorous and setting seed well: there are no signs of genetic decline due to the small size of the population. Seeds of the plant are being stored in the Bolus Herbarium seed-bank. Alien Pines, Acacias, *Hakea* and *Rubus* have been removed from the site, financed with support from a grant from Provincial Nature Conservation. The site has been fenced off to discourage entry from an adjacent picnic-area; also arrangements have been concluded to avoid cutting a fire-belt through the site. Urgency for conservation: as the plant is now in a rather safer, but still Endangered state, it has medium priority.
- E. comptonii*: Critically Rare; shrub; December-January; 3418BD, 3419BD
- E. cremea*: Critically Rare; shrub; October; 3319CA
- E. crucistigmatica*: Endangered; shrub; October; 3318BC/DA, 3418AB/BA
- E. cryptanthera*: Uncertain; shrub; September-November; 3319CC, 3419BB

- E. cyrillaeflora*: Vulnerable; shrub; February-April; 3418AB/AD. Population status: known from two stream-beds about 1 km apart; in each population there are several thousand plants. Alien Acacias are advancing up the valleys where the streams are located and the area is subject to over-frequent veld-fires: this is a serious threat as the plant must reach maturity to produce seed for surviving a fire. The plant is of considerable scientific interest as a local endemic. The populations lie in the Peninsula Nature Area. Urgency for conservation: in general, medium priority, with regular monitoring strongly recommended.
- E. dilatata*: Uncertain; shrub; December; 3018AC
- E. diotaeflora*: Critically Rare; shrub; November-March; 3419BA. Population status: known from two localized places about 3 km apart; at one, there is a vigorous population. The plant should be monitored from time to time, especially in relation to the effects of fire to which it may be sensitive.
- E. dulcis*: Critically Rare; shrub; October; 3418BD, 3419AA/AC
- E. dysantha*: Indeterminate; shrub; January; 3321CD
- E. eburnea*: Critically Rare; shrub; December-April; 3418AD
- E. eriophoros*: Uncertain; shrub; January; 3319AB
- E. ethelae*: Uncertain; shrub; June; 3325DC
- E. fairii*: Endangered; shrub; December-June; 3418AB. Population status: known from only one population which in 1985 had less than 700 profusely flowering plants in a rocky, shallow-soil site measuring 120 by 30 metres in a moderately well-studied area on the Cape Peninsula. An unconfirmed report indicates there are a few outliers within several hundred metres of the above population. Threats: Fires are frequent in the area. The site had been burnt out about five years previously and another fire a year ago came to the edge of the site. Past threats were invasive Pines and alien Acacias which have been cleared from the site by a Mountain Club team. The population lies in the Peninsula Nature Area. The plant is of scientific interest as a small population for which no ecological factor is evident for its extreme localization. Seed-bank: seeds are being stored in the international seed-bank at Wakehurst Place, U.K. Cultivation: the plant has been grown successfully for several years at Kirstenbosch, which is distributing seed to interested persons. Urgency for conservation: maximum priority.
- E. ferrea*: Vulnerable; shrub; December-February; 3318BC/CB/CD/DA/DC, 3418AB
- E. fervida*: Uncertain; shrub; October-November; 3318CD, 3418BD, 3419AC
- E. fontana*: Critically Rare; shrub; October-May; 3418AD
- E. galgebergensis*: Critically Rare; shrub; October-November; 3419BA
- E. gallorum*: Uncertain; shrub; August-September; 3419AA
- E. gossypioides*: Indeterminate; shrub; December-April; 3321AD, 3322AC
- E. granulatifolia*: Critically Rare; shrublet; October; 3321CC
- E. greyii*: Uncertain; shrub; June; 3219CC
- E. heleogena*: Endangered; shrub; January-February; 3418AB. Population status: known from a single population in a well-studied region, consisting of several thousand plants in an area of about 3 ha. The plants are vigorous and show no signs of genetic decline due to confinement to a single population. The plant recovered well with many seedlings when part of the population was burnt. The population lies in land under strict control of the S.A. Navy. Invasion by Acacias along the borders of the population are being held in check by the Navy's conservation section. A broad bulldozed firebelt through the population should be relocated. Urgency for conservation: regular monitoring and action should remain as a high priority.
- E. heleophila*: Uncertain; shrub; January-February; 3320DC, 3322AD/DA/DB

- E. hendricksei:** Critically Rare; shrub; February-April; 3419AD
- E. heterophylla:** Uncertain; shrub; October; 3320DD
- E. hibbertia:** Critically Rare; shrub; September-November; 3319CC/CD. Population status: reports of the plant are probably all from the same population which extends over an area of about 3 ha as scattered groups of individuals totalling about 40. The plants were slow-growing, rather woody, appearing senescent and often stunted due to exposure and dryness of the habitat in exposed rock crevices; the response to fire seemed to be poor. Cultivation: a very beautiful plant which was grown in the U.K. in the early 19th century but, like many Cape heaths, does not seem to have survived to today there. Threats include a recently bulldozed area in part of the population, which was made for road-gravel: this may have destroyed many plants but left a few on intact hummocks. Another threat is invasion by alien Pines. Possible road-widening would destroy a small number of plants. Urgency for conservation: maximum priority.
- E. hippurus:** Critically Rare; shrub; May-July; 3318DB
- E. hirsuta:** Uncertain; shrub; August-September; 3322CD
- E. inamoena:** Uncertain; shrub; October; 3322AC
- E. inordinata:** Critically Rare; shrub; September-February; 3322DB
- E. insignis:** Critically Rare; shrub; October-December; 3320AA, 3322AC
- E. insolitanthera:** Critically Rare; shrub; January-March; 3419BA. Population status: one known population which is confined to a 7 km-long mountain ridge. The plants are vigorous with no signs of population decline. A possible future threat which should be noted in regular monitoring is the spread of alien *Hakea* from densely infested lower slopes. This problem is being actively combatted by Forestry and by biological controls deployed by the Plant Protection Research Institute at Stellenbosch. Cultivation: high potential as this is an attractive plant. Urgency for conservation: medium priority for monitoring.
- E. intricata:** Critically Rare; shrub; March; 3319CC
- E. jasminiflora:** Extinct; shrub; December-February; 3419AD. Population status: formerly on either side of a broad valley, which became reduced to a single population which dwindled from 150 plants in 1977 to 50 in 1981, 15 in 1982, 11 in 1983 and 1 in 1984. The sole survivor was reported dead in early 1985. An attempt at restoring the population with burning and re-seeding in 1978 has so far not resulted in any visible new plants. The area was fenced to keep out grazing animals. Over 40 m of this fence was broken down in 1983. A new fence was erected in 1984. The site has been influenced by silt and drainage from a disused roadway up-slope, but this seems a minor factor. More serious may have been loss of genetic diversity in a small population. Plentiful seed was being produced by the surviving plants but there appeared to be no germination. It is speculated that failure of a mycorrhizal fungal associate may have also been a factor. Seed-bank: seed is being stored at the Bolus Herbarium seed-bank and at Wakehurst Place, U.K. Cultivation: although the plant is beautiful, it does not seem to do well with standard methods. Of three plants grown at Kirstenbosch, one recently died. A further 180 plants were transferred to Kirstenbosch in 1985 from the Provincial Nature Conservation Nursery. Urgency for conservation: maximum priority, especially for bulking up and return to a safe natural habitat.
- E. junonia var junonia:** Endangered; shrub; December; 3319AB. Population status: confined to a single population reported as 302 plants in 1979. It is the long-tubed variety of the fairly widespread *E. junonia* var *minor*. The plants seem to have the same distribution as when they were discovered in 1891. The population reproduces slowly in the absence of fire: most plants were found to be 18-28 years old with some 6-10 years of age: no seedlings could be seen. The plant has the largest flowers in the genus and its pollination biology may prove to be of scientific interest. Cultivation: it is grown at Kirstenbosch, at Brest in France, and at the Royal Botanic Gardens in Edinburgh. There appears to be a significant risk of genetic decline in the small natural population. Urgency for conservation: high priority.
- E. keeromsbergensis:** Critically Rare; shrub; March; 3319DA

- E. keetii*: Uncertain; shrub; September; 3323CC, 3423AA
- E. kraussiana*: Uncertain; shrub; December; 3419BA
- E. lagenaeformis*: Indeterminate; shrub; 3321CD
- E. latifolia*: Uncertain; shrub; 3319AA/AC, 3320CD
- E. lehmannii*: Uncertain; shrub; June-October; 3322CC/CD
- E. lerouxiae*: Vulnerable; shrub; September-October; 3318DD, 3319CC. Population status: at least several hundred plants in two nearby populations. One population covered about 0,5 ha. Threats: the veld containing one of the populations is burnt by the land-owner, while the other is being infested by pines; the plants were reported in 1980 as being picked for the commercial wild-flower trade. Urgency for conservation: maximum priority.
- E. leucosiphon*: Critically Rare; September-October; 3218BD, 3219CC, 3319AA/AD
- E. limosa*: Vulnerable; shrub; October; 3418AB. Population status: five populations are known, four being small (areas down to 10 m²) and one larger: all are confined to marshes and streamsides which are strongly localized in a 5 km-long range in a well-studied area. Threats of alien vegetation and clearing of fire-breaks have come under efficient control by the Cape Town City Parks and Forests Branch. Urgency for conservation should remain at the level of medium priority, especially for regular monitoring.
- E. lowryensis*: Critically Rare; shrub; September; 3418BD/BC
- E. macilenta*: Uncertain; shrub; December-January; 3320DC; 3321C
- E. margaritacea*: Endangered; shrub; October-March; 3318CD, 3418AB. Population status: formerly known from three populations of which one has been extirpated, another very likely so, and the third survives as a few plants in an area of about 3 ha. which urgently requires conservation. Urgency for conservation: maximum priority.
- E. marifolia*: Critically Rare; shrub; November-January; 3318CD, 3418AB. Population status: known from several scattered populations with small groups of plants near rocky overhangs where it is inconspicuous and away from invasive pressures.. Urgency for conservation: low priority for monitoring.
- E. mundii*: Uncertain; shrub; November; 3320CD
- E. nana*: Critically Rare; shrub; September-October; 3418BD
- E. nematophylla*: Critically Rare; shrub; November; 3321CC/CD
- E. obconica*: Uncertain; shrub; October; 3321CC
- E. occulta*: Critically Rare; shrublet; September; 3419DA
- E. octonaria*: Uncertain; shrub; September; 3419AC
- E. oligantha*: Indeterminate; shrub; October; 3419BC/DA/DB
- E. oophylla*: Critically Rare; shrublet; February; 3320CD
- E. ostiaria*: Critically Rare; shrub; September, March; 3321AD, 3322AC, 3324CA/CB/DA
- E. oxyandra*: Uncertain; shrub; December-February; 3320CD
- E. paludicola*: Vulnerable; shrub; December-January; 3418AB. Population status: two nearby populations with several hundred plants, confined to small marshes of about 0,1 ha. Formerly known from a site where it has probably been extirpated by massive invasions of *Acacia* and *Pinus*. Pines are growing near the remaining populations, with *Acacias* not far away. The plant is of interest as a very local endemic. Urgency for conservation: medium priority.

- E. parvulispala:** Critically Rare; shrub; September; 3419BA/BB/CC
- E. patersonia:** Critically Rare; shrub; April-August; 3419AD, 3418AD/BD. Threats: picking.
- E. pauciovulata:** Critically Rare; shrub; October-November; 3419BC
- E. pearsoniana:** Uncertain; shrub; April; 3421A/B, 3422A
- E. pillansii:** Vulnerable; shrub; September-May; 3418BD, 3419AC/AD. Population status: 28 small populations have been mapped in a 9,5 km long range: the populations have several plants to many thousands, in a few places forming patches of colour on the mountain when in flower. A population at another site appears to have been extirpated by agriculture. Some of the populations are protected in a State Forest and the plant has been singled out for special legal protection by Provincial Nature Conservation. Threats: commercial flower pickers once caused widespread damage when they took several tonnes of the plant for export. This has been stopped and illegal poaching is on the decline. Other pressures are agriculture and local trampling and quarrying in the plant's habitat. Cultivation: the plant is showy and is being grown at Kirstenbosch. Urgency for conservation: the plant should remain as a medium priority case.
- E. pilulifera:** Endangered; shrub; May-October; 3318CD. Population status: known in a few small areas in upland marshes. One, covering about 0,5 ha, had no more than a few hundred plants. Threats of invasive alien plants and trampling are being combatted by the Cape Town City Parks and Forests Branch. Urgency for conservation: high priority.
- E. porteri:** Vulnerable; shrub; February-April; 3418BD. Population status: known from a single population of several thousand plants in an area of about 50 ha, in a well-studied region. The upper portion of the population is in a protected State Forest. The lower was, in the custody of a Divisional Council, mined for gravel, destroying several hectares carrying the plant. Part of the area has been leased by the Divisional Council to Somchem, a subsidiary of Armscor. *Hakea* infestations are dense nearby. Cultivation: the plant is very beautiful and is grown at the Harold Porter Botanical Reserve and at Kirstenbosch. Urgency for conservation: high priority.
- E. praenitens:** Uncertain; shrub; April; 3419BB
- E. purgatoriensis:** Vulnerable; shrub; October-December; 3319AA/CC. Population status: one known population of several hundred plants in an area of about 1 ha in a well-searched region. Threats of invasion by alien *Acacia*, *Pinus*, *Hakea* and *Rubus* are being combatted by a Divisional Council, supported by a grant from Provincial Nature Conservation. Urgency for conservation: medium priority.
- E. pyramidalis:** Extinct; shrub; April-May; 3318CD, 3418AB
- E. pyrantha:** Uncertain; shrub; October; 3419AB
- E. quadrisulcata:** Vulnerable; shrub; December-January; 3418AB. Population status: known from a well-explored area in which only a single population of 200 plants could be found in the present survey. The population was threatened by alien *Hakea* and *Pinus* when visited in 1979. The plants appeared to lack vigorous growth and there were no seedlings. It is possible that the population is in a state of decline due to a lack of diversity of adapted genotypes. Cultivation: this attractive plant would be an interesting addition to horticulture if it could be grown successfully. It would be an interesting subject for a study of genetic diversity. Urgency for conservation: high priority.
- E. riparia:** Indeterminate; shrub; September-October; 3419CB/DA/DD. Population status: known from three sites up to 40 km apart. In one population there were several hundred plants, forming dense mats in some parts, increasingly infested with alien *Acacia* which had been unintentionally promoted by regular burning. Urgency for conservation: medium priority.
- E. rufescens:** Uncertain; shrub; January-March; 3319DC, 3419BA
- E. sacciflora:** Critically Rare; shrub; November-March; 3318DD
- E. shannonea:** Critically Rare; shrub; November-January; 3419BC

- E. sociorum*: Endangered; shrub; February-March; 3418AB. Population status: less than 100 plants occur in a single population in a well-explored region. Five seedlings have been found in the population, which may be in a state of genetic decline due to the small population-size. The site has a specialised habitat, receiving summer mists: perhaps the plant has receded after a possible drying of the climate of the summer months, since the end of the Pleistocene. Invasive *Acacia* is in the area but is not yet a pressure on the plant. Urgency for conservation: maximum priority: the plant is nearly extinct.
- E. sonora*: Uncertain; shrub; May-July; 3118DA
- E. stylaris*: Uncertain; shrub; November-December; 3322CC/DD
- E. toringbergensis*: Critically Rare; shrub; December-January; 3321AC
- E. trachysantha*: Uncertain; shrub; September-February; 3322DB
- E. trichophora*: Uncertain; shrub; August-December; 3319DC, 3418BB, 3419AD
- E. trichophylla*: Uncertain; shrub; December; 3419BA
- E. turbiniflora*: Indeterminate; shrub; December-February; 3418BB/BD, 3419BA. Population status: known previously from populations in three places in a 20 km-long range in a moderately well-explored area. One has disappeared after a strip was bulldozed evidently through its habitat. At another no plants could be found, the area being threatened by invasive *Acacias*. A search still has to be made at a third site. Urgency for conservation: high priority.
- E. turgida*: Extinct; shrub; November-April; 3318CD, 3419AA. Population status: extinct at its former locality in the fynbos area surrounded by the race-tracks of the Kenilworth Race Course. There is the possibility the plant may still survive in the wild at a disjunct locality about 50 km away. Cultivation: the plant is still represented in living collections at Kirstenbosch, the Pretoria National Botanic Garden, and at Berlin-Dahlem. Urgency for conservation: maximum urgency for attempting to return the cultivated material to a safe natural habitat.
- E. turrisbabylonica*: Uncertain; shrub; November; 3419AD
- E. umbonata*: Uncertain; shrub; September-December; 3322AC
- E. urna-viridis*: Critically Rare; shrub; all year; 3418AB. Population status: about 4 000 plants scattered in patches in a 2.5 km-long range in a well-explored area. The former threat of invasion by alien *Acacias* and *Pines* is being efficiently combatted by the Cape Town City Parks and Forests Branch. The population appears to be vigorous and although there is some seed-destruction by insects, there is a good spread of ages of plants in the local populations.
- E. ustulenscens*: Indeterminate; shrub; July-September; 3419AA/AC
- E. uysii*: Critically Rare; shrub; October, April; 3420AD. Population status: apparently restricted to a single 10 000-hectare area of limestone hills carrying a few populations totalling several thousand plants of which about a quarter lie in a Provincial Nature Reserve.
- E. valida*: Critically Rare; shrub; November-December; 3322BC/DB, 3324DB
- E. vallis-araneorum*: Critically Rare; shrub; April-June; 3418BB/BD
- E. verticillata*: Extinct; shrub; October-December; 3318CD. Population status: Extinct at its former few sites known on the Cape Flats near Cape Town. Cultivation: surviving in living collections at the Royal Botanic Gardens at Kew, U.K.; also grown at botanic gardens at Berlin-Dahlem, Edinburgh, New Plymouth (New Zealand), Leningrad, Marburg, Tresco (Scilly Isles) and Villa Taranto near Lake Maggiore (Italy); also to be cultivated at Kirstenbosch. Urgency for conservation: maximum urgency to use seed from the cultivated plants to try to establish a population in a comparable habitat to those formerly on the Cape Flats.
- E. vestiflua*: Critically Rare; shrub; January-April; 3418BD
- E. vogelpoelii*: Indeterminate; shrub; December; 3419AB

- E. xanthina*: Uncertain; shrub; September-November; 3419AB/BA/BB
- E. zebrensis*: Uncertain; shrub; November-December; 3321AD/DD
- E. zitzikammensis*: Uncertain; shrub; November-December; 3323DC/DD, 3324CC
- E. zwartbergense*: Uncertain; shrub; December-January; 3322AC
- Eriocephalus tenuipes* (Asteraceae): Uncertain; shrub; April-August; 3323CB, 3324CC
- Eriospermum cervicorne* (Eriospermaceae / Liliaceae): Uncertain; geophyte; October; 2917BC, 3018AD
- E. exilis*: Uncertain; geophyte; January-March; 3319BC, 3320AB/BA
- E. filicaule*: Uncertain; geophyte; March; 2917BA
- E. flabellatum*: Uncertain; geophyte; April; 3220DC/DD, 3320DB/DC
- E. minutiflorum*: Uncertain; geophyte; March-May; 3017BB, 3118AB
- E. patentiflorum*: Uncertain; geophyte; April; 3218BD, 3219AA
- E. pusillum*: Uncertain; geophyte; December-February; 2917DB
- E. stoloniferum*: Uncertain; geophyte; March; 3318CD, 3419AD
- Euchaetis avisylvana* (Rutaceae): Critically Rare; shrub; March-September; 3320DC/DD
- E. diosmoides*: Uncertain; shrub; September-April; 3419DB, 3420CA/BC
- E. esterhuysenae*: Critically Rare; shrub; December-May; 3219AA/AC/CA/CB
- E. intonsa*: Critically Rare; shrub; March-August; 3420AD/BC. Population status: known from a single population of less than 500 plants in a Provincial Nature Reserve.
- E. linearis*: Uncertain; shrub; 3419AB
- E. longicornis*: Endangered; shrub; March; 3421AB. Population status: narrowly endemic with three populations in the same local area. One had 40 plants in an area of about 0,5 ha which was heavily grazed and burnt. Another small population has been recorded in the past in a nature reserve. The safety of this and the third population is much in doubt. The plant is of scientific interest. Urgency for conservation: high priority.
- E. schlechteri*: Critically Rare; shrub; January-September; 3418BB, 3419AB/AC/AD, 3420AC
- E. tricarpellata*: Critically Rare; shrub; September-November; 3218DC
- Eulophia litoralis* (Orchidaceae): Indeterminate; geophyte; December-January; 3318DD, 3419AC/BC. Population status: known from a 420 km-long distribution range along the southern coast, including disjunctions of remote sites 200 km and a further 170 km away. The plants are seldom seen in a population of more than ten together. At one site a single plant was seen in a well-explored area threatened, like so many coastal areas, by an alien *Acacia* infestation. Further study: this plant would make a valuable subject for the study of rarity. Urgency for conservation: medium priority.
- E. platypetala*: Vulnerable; geophyte; October; 3325DC. Population status: known from five disjunct places in a 390 km-long area. The plant appears to be extremely rare in any particular area. Its habitats are generally under pressure from coastal development and alien *Acacia* infestations. Urgency for conservation: medium priority.
- Euphorbia artifolia* (Euphorbiaceae): Uncertain; succulent; September-December; 3421AD
- E. colliculina*: Uncertain; succulent; August; 3322CA

- E. corymbosa*: Uncertain; succulent shrub; 3421BA
- E. cylindrica*: Vulnerable; succulent; 3019CD, 3119AC/BB. Threatened by agricultural activities.
- E. eustacei*: Uncertain; succulent; September; 3320BA, 3224AB
- E. fasciculata*: Vulnerable; succulent; June; 3118BB/BC/DA
- E. hallii*: Critically Rare; succulent; April; 3119CD
- E. marlothiana*: Vulnerable; succulent; August-November; 3318CB/DC, 3418BA. Population status: sparsely distributed in a 50 km-long range in an increasingly heavily-threatened region in the coastal lowlands. At one site, about 100 plants were growing in a 1 ha area, infested by alien Acacias and an exotic grass, with trampling of the plant-cover. The plant occurs in a small nature reserve and is recorded as being cultivated at Kirstenbosch. Further extensive urban development can be expected in the plant's distribution range and more nature reserves are urgently needed for this and many other species. Urgency for conservation: medium priority.
- E. multifolia*: Uncertain; succulent; October; 3320BB, 3321AD
- E. nesemannii*: Vulnerable; succulent; 3319CB/DB
- E. obesa*: Indeterminate; succulent; 3224AD
- E. pentops*: Uncertain; succulent; September; 2917A/DC, 3017BB
- E. pseudoglobosa*: Uncertain; succulent; May; 3421AA/AD
- E. rudolfii*: Uncertain; succulent; 3118AB/BC/CA, 3219AD
- E. symmetrica*: Indeterminate; succulent; 3222BC, 3323AB
- Euryops brevilobus* (Asteraceae): Critically Rare; shrub; July-October; 3219CA, 3319BA
- E. decipiens*: Critically Rare; shrub; October-January; 3319CA, 3321CB
- E. dentatus*: Critically Rare; shrub; December-January; 3123DD, 3224AA
- E. indecorus*: Critically Rare; shrub; October-November; 3418BD. Population status: known from only two places, in a well-explored area; one population has about 100 plants on ledges and in cracks on steep cliffs. Potential future threats which should be noted in monitoring are infestations from dense stands of *Acacia* in the area. Urgency for conservation: medium priority for monitoring.
- E. integrifolius*: Critically Rare; shrublet; November; 3323DA/DB
- E. lasiocladus*: Indeterminate; shrublet; June-August; 3419AD
- E. latifolius*: Critically Rare; shrub; May-June; 3325AD
- E. marlothii*: Critically Rare; shrub; August-October; 3119AD/BC/BD, 3220BC/DA
- E. mirus*: Uncertain; shrub; July-September; 3119AC
- E. muirii*: Endangered; shrublet; September; 3421AD. Population status: three known localities, at one of which it has not been seen for many years in a moderately well-explored region; 31 plants occur in a 25 m² area at a site in a Nature Reserve, with two smaller patches nearby. Threats in the region are alien Acacias and housing development. Urgency for conservation: high priority.
- E. pectinatus ssp lobulatus*: Critically Rare; shrub; October-December; 3218DA/DB/DC
- E. pleodontus*: Indeterminate; shrublet; June; 2917BD
- E. rosulatus*: Critically Rare; shrub; August-September; 3119AC

- E. subcarnosus* ssp *minor*: Critically Rare; shrub; August-October; 3018AC
- E. ursinoides*: Indeterminate; shrub; July-December; 3325CC
- E. virgatus*: Critically Rare; shrublet; July-September; 3119AC
- E. zeyheri*: Uncertain; shrublet; January-May; 3219CD
- Evota venosa* (Orchidaceae): Endangered; geophyte; October-November; 3319AA/AC/AD/CD
- Faucaria candida* (Mesembryanthemaceae): Indeterminate; succulent; March; 3225BA
- F. longidens*: Uncertain; succulent; April; 3224DB
- Faurea macnaughtoni* (Proteaceae): Uncertain; tree; January, July; 3323CC, 3423AA
- Felicia annectens* (Asteraceae): Extinct; annual herb; 3318AB/DB/DD, 3419BB
- F. deserti*: Uncertain; shrub; July-September; 2818CC, 3018AC
- F. diffusa* ssp *khamiesbergensis*: Critically Rare; shrub; October; 3018AC
- F. ebracteata*: Uncertain; shrub; September-October; 3420AD/BC/BD. Population status: exists in apparently a few populations in a Provincial Nature Reserve. In one there were a few hundred scattered plants, difficult to enumerate. Further study: more survey data are needed.
- F. elongata*: Vulnerable; perennial herb; September-October; 3317BB, 3318AA. Population status: known previously from at least two areas (perhaps a third); one population has vanished due to housing development and another cannot be found: its habitat is heavily disturbed and trampled. It may be relatively safe at another site, which should be explored more fully. Urgency for conservation: medium priority.
- F. esterhuyseniae*: Critically Rare; shrub; March; 3322DB
- F. nigrescens*: Uncertain; perennial herb; April; 3419AB
- F. tsitsikamae*: Critically Rare; shrub; December-April; 3323DC
- Ferraria brevifolia* (Iridaceae): Critically Rare; geophyte; September; 3018CA/CC, 3118AA/AB
- F. crispa* ssp *nortieri*: Critically Rare; geophyte; July-September; 3118DD, 3218BB/BD/DC
- F. densepunctulata*: Uncertain; geophyte; May-July; 3218AD, 3318AA
- F. divaricata* var *aurea*: Uncertain; geophyte; September-November; 3017AD, 3118CA/DA, 3218AB
- F. foliosa*: Uncertain; geophyte; September; 3017DC, 3218AB/AD
- F. khamiesbergensis*: Critically Rare; geophyte; August-October; 2917DB, 3017BC, 3018AB/AC/CA, 3019CC, 3119AB/BB
- F. uncinata* ssp *macrochlamys*: Uncertain; geophyte; August-October; 2917DB/DC/DD, 3017BB/BD/DB
- Ficinia gydomontana* (Cyperaceae): Critically Rare; tufted perennial; 3319AB/BC
- F. limosa*: Indeterminate; tufted perennial; September-October; 3318AD/CD
- F. micrantha*: Indeterminate; tufted perennial; November-December; 3318CD
- F. quinquangularis*: Uncertain; perennial herb; March-May; 3320DC, 3321CD, 3322CD
- Freesia corymbosa* (Iridaceae): Uncertain; geophyte; September-October; 3323CA/CB, 3324DD, 3424BB

- F. elimensis*: Critically Rare; geophyte; May-June; 3419DB
- F. sparmannii*: Critically Rare; geophyte; September; 3320DD, 3420BA
- F. speciosa*: Vulnerable; geophyte; August-September; 3320BB/CD/DA/DB, 3321DA
- Freylinia decurrens* (Scrophulariaceae): Indeterminate; shrub; July; 3321CA
- F. visserae*: Uncertain; shrub; September; 3218CB
- Galaxia alata* (Iridaceae): Endangered; geophyte; July-August; 3318AC/BC/CD/DA/DD, 3418AB/BA/BB/BC
- G. barnardii*: Uncertain; geophyte; August-September; 3319CD, 3419AB/AD
- G. ciliata*: Critically Rare; geophyte; June-August; 2917CC, 3118AA/AB
- G. grandiflora*: Critically Rare; geophyte; September; 3018AC
- G. variabilis*: Uncertain; geophyte; September-October; 3219CC/CD, 3319AB/AD/BC
- Galenia fruticosa* var *prostrata* (Mesembryanthemaceae): Uncertain; shrub; October; 3318DA
- Gasteria armstrongii* (Asphodelaceae / Liliaceae): Uncertain; succulent; December-January; 3324DD
- Gazania caespitosa* (Asteraceae): Uncertain; shrubby herb; September-December; 3224AB, 3321AC/CC, 3424BB
- Geissoloma marginatum* (Geissolomaceae): Critically Rare; shrub; July-October; 3320CC/CD, 3321CC/CD
- Geissorhiza brevitubus* (Iridaceae): Uncertain; geophyte; September-October; 3218DC
- G. burchellii*: Uncertain; geophyte; October-January; 3318DD, 3320CD/DC/DD, 3422AA
- G. elsiae*: Critically Rare; geophyte; October-November; 3322DB
- G. furva*: Indeterminate; geophyte; September-October; 3318AD/DB/DD, 3319AC
- G. geminata*: Uncertain; geophyte; September-October; 3219CA/CC, 3318CD, 3319CB/CC, 3419AA/AB
- G. ixioides*: Uncertain; geophyte; August-September; 3219AA, 3319DC
- G. leipoldtii*: Uncertain; geophyte; August-September; 3219AA, 3319DC
- G. lewisae*: Indeterminate; geophyte; August-October; 3217DD, 3218CA/CC, 3219DA, 3318AA/DA/DD
- G. matthewsii* var *matthewsii*: Vulnerable; geophyte; September; 3318AD/BC/DA
- G. matthewsii* var *eurystigma*: Vulnerable; geophyte; September-October; 3318AD/BC/CB/DA
- G. nigromontana*: Critically Rare; geophyte; December-February; 3322AD/BC
- G. outeniquensis*: Critically Rare; geophyte; October-February; 3322CC/CD
- G. ovalifolia*: Uncertain; geophyte; October-November; 3319AC/CC
- G. pappei*: Uncertain; geophyte; September-December; 3319AD, 3418BB, 3419BB
- G. rogersii*: Uncertain; geophyte; August-October; 3319BC
- G. rubicunda*: Uncertain; geophyte; September-October; 3219AA, 3318BB, 3319AA/AD/CB

- Gerbera wrightii** (Asteraceae): Critically Rare; herb; September-November; 3418AB/AD
- Gethyllis ciliaris** (Amaryllidaceae): Vulnerable; geophyte; June-December; 3017CC, 3218CA, 3318AD/BC
- G. herrei**: Uncertain; geophyte; December-January; 3118AD/DA
- G. latifolia**: Extinct; geophyte; February; 3118AB
- G. multifolia**: Vulnerable; geophyte; December; 3319BC
- G. unilateralis**: Uncertain; geophyte; November; 3319AB, 3322CA/CD
- Gibbaeum angulipes** (Mesembryanthemaceae): Uncertain; succulent; July-October; 3222CB, 3321CC, 3421AB
- G. esterhuyseniae**: Extinct; succulent; October-November; 3419BB, 3420AA
- G. nebrownii**: Uncertain; succulent; March-June; 3320DA/DB, 3321AD
- G. pachypodium**: Uncertain; succulent; November; 3321CA
- Gladiolus acuminatus** (Iridaceae): Endangered; geophyte; August-September; 3419AD/AC/BC/BD
- G. alatus var algoensis**: Extinct; geophyte; September; 3325DC
- G. aureus**: Endangered; geophyte; August; 3418AB. This species was formerly known from a few places in a 4 km-long range in a well-explored region, now reduced to a single population of about 60 plants in a patch of about 0,6 ha. This reduction has taken place due to alien *Acacia* infestation, agriculture and urban development. Threats at the present site include a possibility of genetic decline due to the small population size; alien vegetation, which is being controlled within the site but which surrounds it with dense thickets; drainage change due to gravel mining above the site; flower-picking which used to take place has been reduced by a fence but the fence has been broken and the area entered. The site is under control of a Divisional Council. Cultivation: the plant is grown at the Royal Botanic Gardens at Kew, U.K. and at Kirstenbosch, to which material from a Provincial Nature Conservation nursery was transferred in 1985. An attempt is being made to establish a survival population in a Divisional Council Nature Reserve. Seed-bank: 1 700 seeds are in storage in the Bolus Herbarium seed-bank; seeds are being given by Kirstenbosch to interested members of the public. Urgency for conservation: maximum priority.
- G. bilineatus**: Endangered; geophyte; March-April; 3320CD, 3321CC/CD, 3420AB
- G. blommesteinii**: Indeterminate; geophyte; August-October; 3318DD, 3319CC, 3418BB, 3419AA/AB/BB
- G. brevitubus**: Critically Rare; geophyte; September-December; 3419BB
- G. buckerveldii**: Critically Rare; geophyte; January; 3219AC. Population status: known from a single locality in a rather poorly-explored area: it may be found elsewhere in the region but not in abundance. The population consists of about 100 plants. There is a slight risk of damage from plant-collectors, as a path leads to the site: however, it is in a Wilderness Area. Urgency for conservation: should be monitored with 3-yearly visits to the site.
- G. carinatus ssp parviflorus**: Indeterminate; geophyte; June; 3318CB/CD, 3418BA. Population status: known previously from a 45 km-long range, at present at only one site in disturbed ground which is mowed from time to time. The population consisted of 12 plants in a 150 m² patch (others may be in the area as dormant corms). Further study: other formerly-known sites should be explored. The region has, like many other areas in the coastal lowlands, widespread habitat-changes and nature reserves are badly needed here for this and other plants. Urgency for conservation: maximum priority.
- G. carmineus**: Critically Rare; geophyte; February-April; 3418BD, 3419AC, 3420BC

- G. citrinus*: Endangered; geophyte; August-October; 3318DB/DD. Population status: known from two places 35 km apart in the heavily-threatened renosterveld of the coastal lowlands. One population of over 2 000 plants is in a nature reserve which has been under threat from ploughing, the other in a private nature reserve. Seed-bank: seed is being stored in the Bolus Herbarium seed-bank. Cultivation: grown at Kirstenbosch, to which material from Provincial Nature Conservation was transferred in 1985. Urgency for conservation: medium priority.
- G. comptonii*: Critically Rare; geophyte; July; 3118DC
- G. debilis* var *variegatus*: Critically Rare; geophyte; September-October; 3419DA/DB/DC/DD
- G. delpierrei*: Critically Rare; geophyte; January; 3219CA
- G. deserticolus*: Uncertain; geophyte; August-September; 2817DC
- G. engysiphon*: Vulnerable; geophyte; March-April; 3320DC, 3321CC, 3420AB/BA. Population status: known from two populations, one of a single plant, another of 50, threatened by grazing and urban development. Urgency for conservation: high priority.
- G. emiliae*: Vulnerable; geophyte; February-April; 3320DC/DD, 3419BB, 3421AA/AB, 3422AB
- G. equitans*: Indeterminate; Vulnerable; geophyte; August-November; 2917DB, 3017BB, 3018AB/AC
- G. exilis*: Critically Rare; geophyte; April-May; 3319AA
- G. floribundus* ssp *miniatus*: Indeterminate; geophyte; October-December; 3419AC/DA/DB, 3420CA
- G. gracilis* var *latifolius*: Indeterminate; geophyte; August; 3217DD, 3218CC, 3317BB, 3318AA. Population status: known from about 8 populations in a 25 km-long range. Some occur in a private nature reserve. Urgency for conservation: low priority.
- G. gueinzii*: Indeterminate; January-December; 2931, 3327, 3422, 3424
- G. guthriei*: Vulnerable; geophyte; May-July; 3419DA/DB, 3420BC
- G. jonquilliodorus*: Endangered; geophyte; December-January; 3318DC, 3418AB/AD. Population status: known previously from a 40 km-long range in a heavily pressured region. At present known from a population of less than 50 plants in an area threatened by alien *Acacia* infestation and housing development. Seeds of this plant are being stored in the Bolus Herbarium seed-bank. Urgency for conservation: High priority.
- G. kamiesbergensis*: Critically Rare; geophyte; October; 3018AC
- G. lapeirousioides*: Endangered; geophyte; September; 3019CD
- G. leptosiphon*: Critically Rare; geophyte; October; 3321AD, 3322AA/CA/DB
- G. lewisiae*: Endangered; geophyte; September; 3321AD. Population status: known from a single population formerly known to be about 100 plants in a small, fenced-off area. The site has become overgrown with alien *Acacia*, *Robinia* and Apricot trees and the corms are not flowering. Cultivation: the plant is grown at the Adelaide Botanic Garden, Australia and at the University of the Western Cape. Urgency for conservation: maximum urgency, particularly to establish a new population at a nearby, safe site.
- G. maculatus* ssp *hiburnus*: Uncertain; geophyte; May-June; 3420AC, 3421AD/BD
- G. marlothii*: Uncertain; geophyte; October; 3220BA/BC/DA
- G. martleyi*: Uncertain; geophyte; March-May; 3318BB/DD, 3320DD, 3418BB
- G. monticola*: Critically Rare; geophyte; January-March; 3318CD, 3418AB
- G. mostertiae*: Critically Rare; geophyte; November-December; 3119AC

- G. nerineoides*: Uncertain; geophyte; January-March; 3318DD
- G. nigromontanus*: Vulnerable; geophyte; February-March; 3322AC
- G. oreocharis*: Critically Rare; geophyte; December-January; 3219AC, 3319AD/BC
- G. ornatus*: Critically Rare; geophyte; August-October; 3218DD, 3318DC, 3418AB/AD/BA
- G. pillansii* var *roseus*: Indeterminate; geophyte; February-May; 3418AB/AD, 3419AD/BC. Population status: known from 3 populations in a Divisional Council Nature Reserve, consisting of 15 plants in 2 ha; 3 in a few m²; and many plants in 1 ha. The plant is very similar to the common *Gladiolus brevifolius*. Urgency for conservation: medium priority.
- G. pritzelli* var *pritzelli*: Indeterminate; geophyte; August-October; 3119BD
- G. punctulatus* var *autumnalis*: Critically Rare; geophyte; April; 3320DD, 3321CC, 3322CC/CD
- G. quadrangulus*: Endangered; geophyte; August-September; 3318BC/DC, 3418BA/DC
- G. recurvus*: Indeterminate; geophyte; June-October; 3318DC/DD, 3319AB, 3418BB
- G. robustus*: Critically Rare; geophyte; November-January; 3324CB, 3325CB
- G. rogersii* var *vlokii*: Critically Rare; geophyte; February-March; 3322CC
- G. salteri*: Critically Rare; geophyte; September; 2918CA
- G. sempervirens*: Critically Rare; geophyte; February-April; 3322CD/DD, 3323DD
- G. stefaniae*: Critically Rare; geophyte; April; 3320CC
- G. stokoei*: Endangered; geophyte; March-April; 3218DC, 3419BA/BB
- G. subcaeruleus*: Uncertain; geophyte; April-May; 3419AB/AD/BA/BB/DA
- G. tristis* var *concolor*: Uncertain; geophyte; September; 3419AB/AC, 3420BC/CC
- G. vigilans*: Critically Rare; geophyte; October-November; 3418AD/BB. Population status: known from two disjunct sites on the opposite sides of False Bay, 45 km apart. At one population, the habitat was being cleared of invasive alien Acacias: at the time of one visit, the corms had not flowered due to an unknown dormancy factor; in the next year 11 plants were found in a 100 m² patch. Urgency for conservation: maximum priority for a monitoring programme.
- G. violaceo-lineatus*: Critically Rare; geophyte; July-August; 3118DD, 3218BD, 3219AA/AC/CB
- G. virescens* var *roseo-venosus*: Indeterminate; geophyte; September; 3319CB/CD
- G. viridiflorus*: Critically Rare; geophyte; May-July; 2917BA/BC/DB, 3119AC
- G. watermeyeri*: Critically Rare; geophyte; July-September; 3119AC/CA/CD, 3219AA/AC
- Glischrocolla formosa* (Penaeaceae): Vulnerable; shrub; October-February; 3418BB, 3419AA
- Glottiphyllum uniondalense* (Mesembryanthemaceae): Uncertain; succulent; October, April; 3323CA
- Gnaphalium simii* (Asteraceae): Indeterminate; shrublet; January-March; 3124AB, 3419BB
- Gnidia leipoldtii* (Thymelaeaceae): Uncertain; shrub; August; 3119AC
- G. parviflora*: Uncertain; shrub; November-December; 3218DB/DC, 3319AA, 3322CC, 3419BA
- G. scabrida*: Uncertain; shrub; July; 3321CC
- Grammitis poeppigana* (Grammitidaceae): Critically Rare; fern; 3419AA

- Grisebachia ciliaris* ssp *bolusii* (Ericaceae): Indeterminate; shrub; September-October; 3218BB, 3219AA
- G. ciliaris* ssp *involuta*: Indeterminate; shrub; October; 3219AA
- G. incana*: Indeterminate; shrub; April-July; 3318CB/DA/DC/DD, 3418BB
- G. minutiflora* ssp *nodiflora*: Indeterminate; shrub; January; 3219CC
- G. niveni*: Indeterminate; shrub; July-September; 3420AB/BA
- G. plumosa* ssp *eciliata*: Indeterminate; shrub; July; 3118DD
- G. plumosa* ssp *hirta*: Indeterminate; shrub; September; 3318AD/CB/DA
- G. plumosa* ssp *hispida*: Indeterminate; September; 3218BC/BD/DB
- G. plumosa* ssp *irrorata*: Indeterminate; shrub; July; 3318AD/BC/CB/DA/DB
- G. rigida*: Vulnerable; shrub; August-October; 3319CB/CC/CD, 3419AA/AB
- G. secundiflora*: Indeterminate; shrub; October; 3219CD
- Grubbia rourkei* (Grubbiaceae): Critically Rare; shrub; all year; 3418BD
- Haemanthus canaliculatus* (Amaryllidaceae): Vulnerable; geophyte; January-March; 3418BD. Population status: known from a 12 km-long range, in a few places some of which are on housing plots in a township. Many hundreds of plants are seen flowering after a fire. Urgency for conservation: high priority for translocation to a nearby reserve and for the proposed establishment of a Nature Area in the region.
- H. nortieri*: Critically Rare; geophyte; March-April; 3118DD. Population status: although the plants are very localized, their rocky habitat prevents agricultural utilization.
- H. pumilio*: Endangered; geophyte; March-April; 3119CC, 3318DD. Population status: one population of many hundreds of plants is known in a site which may have its natural habitat destroyed at any time. Two other populations are situated on farms: they are probably too small and prone to habitat change to be viable in the long term.
- Harveya euryantha* (Scrophulariaceae): Uncertain; perennial herb; November-December; 3419AA/DA
- Haworthia blackburniae* (Asphodelaceae / Liliaceae): Critically Rare; succulent; September-December; 3321BC/DA
- H. marginata*: Indeterminate; succulent; January-March; 3320CC, 3420AC/BB, 3421AA/AB/BA
- H. maughanii*: Indeterminate; succulent; March-May; 3321DA
- H. rubriflora*: Indeterminate; succulent; March-April; 3319DD, 3320CC
- H. springbokvlakensis*: Indeterminate; succulent; 3324BD
- H. truncata*: Indeterminate; succulent; February-April; 3322AD/CA
- Helichrysum archeri* (Asteraceae): Uncertain; shrublet; October-December; 3320BA/BC
- H. cochleariforme*: Uncertain; herb; October-November; 3321CD/DC, 3421AD
- H. concinnum*: Uncertain; herb; September-November; 2917BA/BC/BD, 3320AD
- H. filagineum*: Uncertain; annual herb; August-October; 2917AA/DB, 3017BC, 3118AB/DC
- H. leptorhizum*: Uncertain; annual herb; September; 3018CC

- H. ramulosum:** Uncertain; shrublet; January; 3323DD
- H. recurvatum:** Vulnerable; shrublet; October-November; 3325AA/BD/CD/DA/DB/DD. Population status: a conspicuous plant known from about five places in a 70 km-long range; at one population several hundred plants were seen in a 1 ha. area. At this site the plants were being damaged by grazing; road building is a potential threat. Urgency for conservation: medium priority.
- H. simulans:** Uncertain; shrublet; December; 3320BA/BC
- Helictotrichon barbatum (Poaceae):** Uncertain; tufted perennial; 3018AC
- H. namaquense:** Uncertain; tufted perennial; November; 3018AC, 3119DD
- H. quinquesetum:** Uncertain; tufted perennial; 3318CD
- Heliophila cedarbergensis (Brassicaceae):** Critically Rare; shrublet; October-December; 3219AC/AD
- H. cinerea:** Critically Rare; perennial herb; November-December; 3418AB/AD. Population status: known from four places in a 3,5 km-long range, at two of which there were several hundred plants. Major efforts are under way to remove the alien *Acacia* infestations in the area. Urgency for conservation: medium priority.
- H. collina:** Critically Rare; annual herb; August-September; 3118DD, 3119AC/AD
- H. cuneata:** Vulnerable; shrub; August; 3318DD
- H. eximia:** Critically Rare; perennial herb; September; 2816BD
- H. filicaulis:** Critically Rare; shrublet; October; 3319BC
- H. laciniata:** Critically Rare; annual herb; September; 2917DA/DB, 3118AB
- H. leptophylla:** Uncertain; annual herb; September; 3118AA
- H. patens:** Critically Rare; annual herb; July; 3118B/D, 3218DC
- H. ramosissima:** Uncertain; shrublet; October; 3325CD, 3419AA
- H. rimicola:** Critically Rare; shrublet; December; 3321AC
- H. tabularis:** Critically Rare; annual herb; November; 3318CD, 3418AB
- H. tricuspidata:** Critically Rare; shrublet; October; 3319DC, 3418BB, 3419BA
- Hermannia concinnifolia (Sterculiaceae):** Indeterminate; shrub; June-September; 3419BD, 3420AD/BC/BD, 3421AC/BA
- H. cordifolia:** Indeterminate; shrub; October; 3218DA/DC
- H. helicoidea:** Critically Rare; shrub; August-October; 3218DB, 3219AC/CA
- H. hispidula:** Uncertain; shrub; September-October; 3218DC/DD
- H. micrantha:** Indeterminate; shrub; August-November; 3418AB
- H. pillansii:** Indeterminate; shrub; October; 3320BA/BB, 3322BC
- H. procumbens ssp myrrhifolia:** Uncertain; shrub; August-September; 3218AB/BA, 3118AD/BC/CB
- H. procumbens ssp procumbens:** Endangered; shrub; August-November; 3318CD
- H. repetenda:** Uncertain; shrub; September-November; 3218AD/DB/DD, 3219AA/AC, 3224AB

- H. rudis*: Indeterminate; shrub; July-November; 3418AB/AC/AD, 3419AC/BD, 3420BC
- H. rugosa*: Vulnerable; shrub; July-October; CD/DB/DC
- H. trifoliata*: Indeterminate; shrub; August-October; 3420AD/CA, 3421AC/AD/BA
- Herreanthus meyeri* (Mesembryanthemaceae): Indeterminate; succulent; 2917BA
- Herschelianthe barbata* (Orchidaceae): Endangered; geophyte; September-October; 3318BC/CD/DA, 3418AB. Population status: known from two sites 55 km apart in a well-explored region in the heavily threatened natural vegetation of the coastal lowlands. At one site there were two populations of 3 plants each. Threats at this site are alien *Acacia* infestations, agriculture, over-frequent fires and salinization from nearby farmlands. Urgency for conservation: maximum priority.
- H. forcipata*: Uncertain; geophyte; 3423AA
- H. forficaria*: Critically Rare; geophyte; January-February; 3418AB, 3419AA
- H. lugens* var *lugens*: Vulnerable; geophyte; October-November; 3318CD/DC, 3322DB, 3324CB, 3325DC, 3418BA
- H. lugens* var *nigrescens*: Indeterminate; geophyte; February; 3424BA
- H. newdigateae*: Uncertain; geophyte; March-April; 3323CD
- H. schlechteriana*: Critically Rare; geophyte; December; 3321CC, 3421AA
- H. spathulata* ssp *tripartita*: Critically Rare; geophyte; September-October; 3323CA/CB/CC/DC
- H. venusta*: Uncertain; geophyte; October-December; 3318CD, 3418AB
- Hessea chaplinii* (Amaryllidaceae): Vulnerable; geophyte; March; 3217DD, 3318AA
- H. karooica*: Critically Rare; geophyte; April; 3320BA/BC
- H. leipoldtii*: Critically Rare; geophyte; April-May; 3118DC, 3218AB/BB
- H. mathewsii*: Vulnerable; geophyte; May; 3217DD, 3218CC
- H. spiralis*: Vulnerable; geophyte; May; 3118AC
- H. unguiculata*: Vulnerable; geophyte; May; 3119CC
- Hesperantha ciliolata* (Iridaceae): Critically Rare; geophyte; September-October; 3220BC
- H. elsiae*: Critically Rare; geophyte; December; 3219
- H. hantamensis*: Uncertain; geophyte; July-August; 3119BD
- H. juncifolia*: Endangered; geophyte; September-October; 3419DC
- H. karooica*: Uncertain; geophyte; August; 3119BD
- H. latifolia*: Uncertain; geophyte; September-October; 3018AC, 3119BC
- H. minima*: Critically Rare; geophyte; October-November; 3018AC
- H. namaquana*: Critically Rare; geophyte; July-August; 3018CD, 3118AB
- H. oligantha*: Critically Rare; geophyte; September; 3119BC
- H. pallescens*: Endangered; geophyte; August-September; 3218DB

- H. purpurea:** Critically Rare; geophyte; August-September; 3119BC
- H. saldanhae:** Extinct; geophyte; August; 3217DD
- H. vaginata:** Vulnerable; geophyte; August-September; 3119AC/BC
- Heterolepis mitis (Asteraceae):** Uncertain; shrub; January; 3320DC, 3325AC
- Hippia hirsuta (Asteraceae):** Uncertain; shrublet; August-November; 3319CC, 3321CC, 3419AD
- Holothrix confusa (Orchidaceae):** Indeterminate; geophyte; August-October; 3118DC, 3119CB/CD, 3219CD, 3319BC
- H. grandiflora:** Uncertain; geophyte; March; 3118CA, 3218AB, 3321BC/BD/DA/DB
- H. pilosa:** Indeterminate, geophyte; November-December; 3321AD, 3323DD, 3325DC, 3421BA
- Homeria autumnalis (Iridaceae):** Indeterminate; geophyte; April-June; 3219CA
- H. bolusiae:** Indeterminate; geophyte; August-September; 3118BB/DC/DD, 3119CA
- H. cedarmontana:** Critically Rare; geophyte; August-October; 3219AC/CC
- H. comptonii:** Vulnerable; August-September; 3419AA/AB/AC/AD/BC
- H. elegans:** Endangered; geophyte; August-October; 3419AB/BA/BB/BC/BD. Population status: known from a few small colonies at road verges, steeper banks and very rocky sites in a roughly 20 km-long range. Natural vegetation in the area has been almost entirely replaced by wheatlands. The plant is under pressure from changes in soil fertility by fertilizers, the spread of agricultural weeds into its habitats, aerial weed-killer spraying and road-building and maintenance. It would be a very attractive species for cultivation. Urgency for conservation: maximum priority.
- H. fenestrata:** Indeterminate; geophyte; July-August; 3119DC
- H. fuscomontana:** Indeterminate; geophyte; September; 3219CD
- H. lucasi:** Uncertain; geophyte; August-September; 3318CD
- H. odorata:** Vulnerable; geophyte; August-September; 3119AC
- H. patens:** Critically Rare; geophyte; August-September; 3218BB, 3219AA
- H. pendula:** Indeterminate; geophyte; October-November; 3018AC
- H. ramosissima:** Critically Rare; geophyte; July-September; 2917BC/DB, 3118AB/BC
- H. spiralis:** Critically Rare; geophyte; August-September; 3119AA/AC
- H. vallisbelli:** Critically Rare; geophyte; July-September; 3119AC/CA, 3219BA
- Homoglossum fourcadei (Iridaceae):** Indeterminate; geophyte; September-November; 3322DB. Population status: one population of about 50 plants survives, those at other localities having vanished as a result of habitat changes by agriculture. The remaining population is severely threatened by grazing. Urgency for conservation: maximum priority.
- H. guthriei:** Critically Rare; geophyte; August-September; 3419AD/BC/CB/DA/DB
- H. merianellum var aureum:** Critically Rare; geophyte; September-October; 3418AB/AD. Threats: illegal flower-picking, Pine plantations.
- H. merianellum var merianellum:** Critically Rare; geophyte; May-July; 3418AB/AD. Population status: known from four places in a 20 km-long range; at one of which there were 8 scattered plants in an area of 500 m². The plant is very attractive and may be under pressure from illegal flower-pickers. Pine plantations are a possible pressure. Cultivation: the plant could be highly-valued in horticulture if it were to prove easy to grow. Urgency for conservation: medium priority.

- H. vandermerwei*: Endangered; geophyte; September; 3419AA/BD, 3420AC/AD/BD
- Hoodia albispina* (Asclepiadaceae): Vulnerable; succulent; 3022AD
- H. barklyi*: Indeterminate; succulent; November; 3321BC
- H. dregei*: Indeterminate; succulent; September-January; 3221DA, 3222BC, 3322AA
- H. pillansii*: Indeterminate; succulent; November-January; 3320BC, 3322AA
- Huernia distincta* (Asclepiadaceae): Critically Rare; succulent; December-May; 3320BA/BC
- H. humilis*: Indeterminate; succulent; January-April; 3024CA, 3221CD, 3222BA
- H. insigniflora*: Indeterminate; succulent; 3224DA
- H. kennedyana*: Indeterminate; succulent; 3225BA
- H. longii*: Indeterminate; succulent; April; 3325CD
- H. praestans*: Indeterminate; succulent; November-March; 3320BC, 3321AD/CB/DA, 3421AB
- H. simplex*: Vulnerable; succulent; 3123AC
- H. witzbergensis*: Endangered; succulent; 3319AC
- Hyaenanche globosa* (Euphorbiaceae): Uncertain; shrub/tree; July-September; 3118DA
- Hyobanche barklyi* (Scrophulariaceae): Uncertain; parasitical herb; 2916BD
- Hypodiscus alternans* (Restionaceae): Critically Rare; tussock herb; February-May; 3418BD, 3419AA/AC
- H. sulcatus*: Critically Rare; tussock herb; October-December; 3319BD, 3320AA/AB
- Indigofera hispida* (Fabaceae): Uncertain; shrub; May-August; 3323DC, 3325CC
- I. superba*: Critically Rare; shrub; December; 3419AD
- Ischyrolepis coactilis* (Restionaceae): (= *Restio communis*, fide H.P. Linder, ined.); Vulnerable; tussock plant; August-April; 3418AB. Population status: known from four small populations confined to a few square metres in scattered marshes in a 6.5 km-long area, in a well-explored region. The plant had been threatened by fire-breaks being cut through colonies, by Pine plantations and by alien *Acacia* infestations: all these pressures are coming under control of the Cape Town City Parks and Forests Branch. Urgency for conservation: high priority.
- I. duthiae*: (= *Restio duthiae*, fide H.P. Linder, ined.); Vulnerable; tussock herb; October-May; 3318DD, 3418BB. Population status: formerly known from areas within a 70 km-side triangle in the heavily threatened vegetation of the coastal lowlands. Only one population was found in the present survey, with scattered plants in a hectare of a small relict patch surrounded by wheatlands. The patch is to be kept as a small reserve by the land-owner. Funds are needed for fencing this and other fynbos patches in the area. Urgency for conservation: medium priority.
- I. esterhuyseniae*: (= *Restio esterhuyseniae*, fide H.P. Linder, ined.); Critically Rare; tussock plant; June-July, November; 3319BA/BC
- I. fuscidulus*: (= *Restio fuscidulus*, fide H.P. Linder, ined.); Critically Rare; tussock plant; October; 3319CB
- I. sabulosus*: (= *Restio sabulosus*, fide H.P. Linder, ined.); Endangered; tussock herb; April-September; 3318DC, 3418BA, 3419DA/DB/DC/DD.
- I. setiger*: (= *Restio setiger*, fide H.P. Linder, ined.); Uncertain; tussock plant; August; 3219AA

- Isoetes capensis var stephansenii (Isoetaceae):** Indeterminate; geophyte; August-December; 3318DD
- Isolepis inconspicua (Cyperaceae):** Indeterminate; annual herb; October; 3318CD, 3418BB
- Ixia bellendenii (Iridaceae):** Uncertain; geophyte; October; 3319CD, 3419DA
- I. brevituba:** Uncertain; geophyte; September-October; 3219BD/DB, 3220DB
- I. campanulata:** Indeterminate; geophyte; September-November; 3319AA/CA
- I. cochlearis:** Uncertain; geophyte; November; 3318DD, 3319CC
- I. conferta var conferta:** Uncertain; geophyte; August-October; 3219CA, 3318BB/BD/DB, 3319AC
- I. conferta var ochroleuca:** Uncertain; geophyte; August-September; 3318BD/DB
- I. curta:** Vulnerable; geophyte; 3318AD/BA/BC/CB/DA
- I. curvata:** Uncertain; geophyte; September; 3119AC/BD
- I. framesii:** Endangered; geophyte; September-October; 3318AD/BC/DA
- I. gloriosa:** Indeterminate; geophyte; August-September; 3320CD
- I. leipoldtii:** Uncertain; geophyte; September-October; 3320DC, 3322AC/AD
- I. maculata var fusco-citrina:** Uncertain; geophyte; September-October; 3119AC, 3319AD
- I. maculata var intermedia:** Uncertain; geophyte; September; 3118DC, 3218BC/DA
- I. maculata var maculata:** Vulnerable; geophyte; September; 3318AD/DC
- I. patens var linearifolia:** Indeterminate; geophyte; September; 3319CD
- I. patens var patens:** Indeterminate; geophyte; October-November; 3119AC, 3419DA
- I. purpureorosea:** Critically Rare; geophyte; September-October; 3317BB, 3318AA
- I. rouxii:** Uncertain; geophyte; 3219CC, 3318BB, 3319AA/CA
- I. splendida:** Critically Rare; geophyte; October-November; 3218DB
- I. stolonifera:** Indeterminate; geophyte; September; 3319DB
- I. thomasiae:** Uncertain; geophyte; September-October; 3120CC
- I. trifolia:** Uncertain; geophyte; July-August; 3320AB/AD/BB/BC/C/DC
- I. versicolor:** Vulnerable; geophyte; October; 3318DC/DD, 3418BB. Population status: formerly known from a number of sites on lowland flats in a high-impact area of agricultural and urban development, extending over a 25 km-long range. At one site a population of a few hundred individuals dispersed over some 30 ha is being wiped out by coastal township development. It had already been under pressure from trampling, dumping, and alien *Acacia* infestations. The plant would be an attractive subject for horticulture. Urgency for conservation: high priority.
- I. viridiflora:** Vulnerable; geophyte; September-October; 3319AC
- Juncus obliquus (Juncaceae):** Uncertain; annual herb; October; 3219CA
- J. fasciculiflorus:** Uncertain; perennial herb; September; 3319BA
- J. parvulus:** Uncertain; herb; November; 3018AA

- J. polytrichus*: Uncertain; herb; November; 3018AC
- Juttadinteria albata* (Mesembryanthemaceae): Indeterminate; succulent; 2816DA
- J. tetrasepala*: Indeterminate; succulent; 2816DD
- Kensitia pillansii* (Mesembryanthemaceae): Critically Rare; succulent shrub; October-December; 3218DA
- Klattia partita* (Iridaceae): Critically Rare; shrub; December; 3418BB/BD, 3420BB
- Klingia namaquana* (Amaryllidaceae): Uncertain; geophyte; December; 2816BD/CB, 2817CA/CC, 2917BC
- Kniphofia acraea* (Asphodelaceae / Liliaceae): Indeterminate; tussock plant; March; 3225AD
- Kobresia ecklonii* (Cyperaceae): (= *Schoenoxiphium ecklonii*); Uncertain; perennial herb; July-October; 3424
- K. lehmannii*: (= *Schoenoxiphium lehmannii*); Uncertain; perennial herb; October-January; 3323DD
- Lachenalia campanulata* (Hyacinthaceae / Liliaceae): Indeterminate; geophyte; November-December; 3225DA, 3319CD, 3419AB
- L. concordiana*: Indeterminate; geophyte; September; 2917DB, 3018CA
- L. congesta*: Uncertain; geophyte; June-September; 3120CC, 3220BC/BD
- L. esterhuysenae*: Uncertain; geophyte; September-December; 3219AA/AC
- L. haarlemensis*: Indeterminate; geophyte; October; 3323CB, 3325DC
- L. macgregori*: Uncertain; geophyte; October-November; 3119AC
- L. margaretae*: Uncertain; geophyte; October-December; 3218AA
- L. mathewsii*: Endangered; geophyte; September-October; 3217DD
- L. namaquensis*: Indeterminate; geophyte; August-September; 2816, 2817, 2917BA/BD
- L. polyphylla*: Vulnerable; geophyte; September-October; 3218BC/BD, 3319AA/AC
- L. polypodantha*: Uncertain; geophyte; August-September; 2917BB/DB
- L. purpureo-caerulea*: Endangered; geophyte; September-October; 3218AB/BA/DB, 3318AD/DA, 3319AC
- L. rhodantha*: Indeterminate; geophyte; November-December; 3224DD
- L. sargeantii*: Uncertain; geophyte; after fire; 3420CA
- L. schelpei*: Uncertain; geophyte; June-July; 3119BC/BD
- L. verticillata*: Critically Rare; geophyte; September; 2817AC, 2917BA/BC/DB
- L. viridiflora*: Vulnerable; geophyte; May-June; 3217DB/DD
- Lachnaea elegans* (Thymelaeaceae): Uncertain; shrub; 3319AD
- L. eriocephala*: Critically Rare; shrub; August-September; 3318DA, 3418BB/BD
- L. glomerata*: Indeterminate; shrub; September; 3325CC, 3424BB

- Lachnostylis bilocularis (Euphorbiaceae):** Vulnerable; shrub/tree; November-May; 3321DA, 3322BC/DA, 3323CA
- Lampranthus arbuthnotiae (Mesembryanthemaceae):** Uncertain; succulent shrub; August; 3319CB, 3418BA, 3419DD, 3420CC
- L. dunensis:** Indeterminate; succulent; October-December; 3418AB/BA/BB, 3419AC
- L. rustii:** Critically Rare; succulent shrub; August-December; 3321AD, 3421AB
- Lapeirousia corymbosa ssp alta (Iridaceae):** Uncertain; geophyte; December-January; 3319CA, 3418BB, 3419AA
- L. verecunda:** Critically Rare; geophyte; August-September; 2917DA
- Laurentia giftbergensis (Campanulaceae):** Uncertain; herb; September-October; 3118DC
- L. longitubus:** Uncertain; herb; November; 3321CC/CD
- Lebeckia bowieana (Fabaceae):** Uncertain; shrublet; (no flowering time or locality data)
- Lessertia carnososa (Fabaceae):** Uncertain; shrublet; June; 3325AD/DC
- L. globosa:** Indeterminate; herb; October; 3318CB
- L. kensitii:** Uncertain; perennial herb; September; 3325DC
- Leucadendron argenteum (Proteaceae):** Vulnerable; tree with good regeneration after fires; September; 3318CD/DB/DD, 3418AB. Population status: known from eight populations on the Cape Peninsula extending over an 11 km-long range, and Somerset West and Paarl 35 and 50 km inland. The inland populations may be descended from plants taken there by early settlers, as the plant used to be grown for firewood. The largest population is in the Kirstenbosch gardens and on the surrounding slopes, estimated in 1980 to be about 6 850 plants over about 9 ha; other populations on the Cape Peninsula are as follows: 2 770 in 13 ha at Vlakkenberg; 1 320 in 17 ha at Newlands Forest; 700 in 5 ha at Lion's Head (since supplemented by extensive plantings of the species); 370 plants in 0,5 ha at Wynberg Hill; 205 in 0,5 ha at Orange Kloof; 56 in 1,8 ha at Hout Bay (since partly destroyed by clearing for houses; and 52 in 1 ha at Devil's Peak (since supplemented by planting by the Cape Town City Parks and Forests Branch at the rate of 6 000 seedlings per year in what was evidently part of the plant's former habitat). Because the plant is confined to lower mountain slopes, it is mostly below the boundary of the Peninsula Nature Area and much in the pathway of urban development, as at Hout Bay. A few of the populations of this beautiful and famous plant are threatened by alien *Acacia* infestations. Invasive plants have been rigorously removed from the Kirstenbosch population. Cultivation: the plant is widely known as a splendid ornamental tree. Urgency for conservation: medium priority.
- L. bonum:** Endangered; shrub; October; 3219CB. Population status: known from a single population in a remote but well-explored mountain area. After a fire in 1982, the population was reduced from 50 to only 7 plants. The species may be in a state of genetic decline due to the small size of the population. Over-frequent or wrong-season fires may be another factor contributing to the plant's decline. Cultivation: Kirstenbosch had one plant in 1982 (two are needed for reproduction as the plant is dioecious). It was on the priority list for cultivation at the nursery of the Provincial Nature Conservation but no more of such work is to be done there. Urgency for conservation: maximum priority.
- L. brunioides var flumenlupinum:** Critically Rare; shrub; September; 3218BA
- L. burchellii:** Indeterminate; shrub; August; 3319DC
- L. cadens:** Critically Rare; shrub; October; 3320BA/BC. Population status: known from a single population on a 3 km-long summit ridge. Urgency for conservation: low priority, for occasional monitoring.

- L. chamelaea:** Endangered; shrub; September; 3319AB/AC/CD. Population status: known previously from 18 populations in a 70 km-long range, rapidly reduced in recent years by extension of agriculture. At present further searches are needed to determine whether any natural populations of this plant still survive. Cultivation: Kirstenbosch reported having 352 seedlings and 56 adult plants in cultivation; the plant is also being grown at the Orotava Gardens in Teneriffe and at the Adelaide Botanic Garden in Australia. Urgency for conservation: maximum priority for further survey and re-establishment of natural populations in conservation areas.
- L. cinereum:** Vulnerable; shrub; October; 3318AB/AC/BC/DA/DD. Population status: formerly known from a number of places in a 100 km-long range in the coastal lowlands. At many places the plant has evidently been extirpated due to agriculture. At one there were many thousands of plants in a 1 250 ha area, but they were threatened by alien *Acacia* infestations, by extension of cultivated lands and by grazing by livestock. Urgency for conservation: low to medium priority, depending on the rate of advance of land-use pressures.
- L. comosum ssp homeophyllum:** Indeterminate; shrub; December-February; 3319CA
- L. concavum:** Vulnerable; shrub; September; 3219AA. Population status: known from 2 populations a few kilometres apart, each with several thousand plants over a few hectares. One of the populations is in a Wilderness Area. Threats: over-frequent fires appear to have been causing a decline in numbers of plants. Urgency for conservation: low priority.
- L. coriaceum:** Critically Rare; shrub; August-September; 3420AB/AC/BA/BC, 3421AB
- L. corymbosum:** Vulnerable; shrub; September-October; 3318BC/DA/DD, 3319AC/CA. Population status: formerly known from about fifteen places in a 110 km-long range, now extirpated by urban and agricultural development in at least two, probably several. At a large population there were several thousand plants in an area of a few hectares. The area had been heavily grazed and ploughing may be extended into the population. Urgency for conservation: medium priority.
- L. cryptocephalum:** Vulnerable; shrub; March-May; 3419AD, 3420BC. Population status: previously known from four places in a 120 km-long range in a well-explored area. It has been extirpated at two of the places. At another there are several thousand plants in a 10 km long zone just outside a Provincial Nature Reserve, where it is threatened by frequent burning and overgrazing. At another there were, in 1980, 7 adult plants and about 200 seedlings, all within about 2 ha. The population is threatened by agriculture, over-frequent fires and habitat disturbance. The population-size is being boosted by means of a seeding and burning programme by Provincial Nature Conservation. Seeds are being stored in the Bolus Herbarium seed-bank. Cultivation: grown at Kirstenbosch and the Caledon Wildflower Garden. Urgency for conservation: high priority.
- L. diemontianum:** Critically Rare; shrub; June; 3219CC, 3319AA
- L. discolor:** Critically Rare; shrub; September; 3218DA/DC
- L. elimense ssp elimense:** Endangered; shrub; August-September; 3419BD/DA/DB/DD. Population status: known from 8 populations in four areas with heavily threatened habitats, in the coastal lowlands. The population sizes vary from 12 to several hundred. Cultivation: the plant is grown at Kirstenbosch. Threats: grazing and trampling by cattle, too-frequent fires, ploughing, quarrying, flower picking, alien *Acacia* infestations. Urgency for conservation: high priority.
- L. elimense ssp salteri:** Vulnerable; shrub; August-September; 3419AD
- L. elimense ssp vyeboomense:** Endangered; shrub; September-October; 3419AA. Population status: known only from a small area in a fruit-growing region. Fifty plants had survived up to 1978 but had been extirpated by 1981. Some 220 seeds had been collected in 1978 and these are to be used for re-establishing the plant in an area being cleared of alien plants prior to burning. Urgency for conservation: maximum priority.

- L. ericifolium:** Vulnerable; shrub; November; 3320DC, 3321CC/CD/DD, 3322CC. Population status: previously known from three places at which the populations are now believed to have been extirpated. Two further populations have been found, one of which has several thousand plants scattered through an area of about 50 ha on the boundary between a farm and Forestry land. The population is starting to be infested with *Hakea* and over-frequent fires are preventing adequate seed-set. Urgency for conservation: medium priority.
- L. flexuosum:** Endangered; shrub; April-May; 3319CB. Population status: formerly known from two sites, at one of which it was destroyed in 1984 by ploughing. The remaining small population lies next to a National Road. In 1975 a survey showed only 22 plants: now there are several hundred. The population is threatened by a change of land-use as well as a possible change of alignment of the National Road: either could make the plant extinct. Attempts since 1978 to extend a local nature reserve to include the site have proved fruitless. Cultivation: there are records of the plant having been grown at Kirstenbosch and at the Adelaide Botanic Garden, Australia. Urgency for conservation: maximum priority.
- L. floridum:** Endangered; shrub; September-October; 3418AB/AD. Population status: previously known from a 40 km-long range extending into areas which are now heavily urbanized. Two populations of an original nineteen remain. One is in a nature reserve with about a thousand plants in a 700 m-long marsh, threatened by a nearby alien *Acacia* infestation; the other is about 8 km away and has about 60 plants (reduced from about 200 after a recent fire), along about 80 m of a stream-side. This population is almost surrounded by extensive groves of alien *Acacias*; rubbish from a nearby township has been dumped near the plants; and when mature, the flower-heads are picked for decorative purposes. Cultivation: there is a vigorous bed of the plant at the Kirstenbosch Gardens and it is also grown at the Adelaide Botanic Garden in Australia. Kirstenbosch has distributed seed to interested members of the public. Urgency for conservation: high priority.
- L. globosum:** Vulnerable; shrub; September-October; 3419AA. Population status: eight populations totalling over 1 300 plants are known, censused with seedlings at 1 096, 107, 94, 27, 13, 10, 4 and 3 individuals. Threats: the plant is confined to steep, shaded slopes which are unsuitable at present for forestry or agriculture although this may change with new methods: the region in which it grows is one of the most fertile in the western Cape. Many of the populations are threatened by alien vegetation, particularly *Pinus pinaster*. Several sites appear to require fire to regenerate much-reduced populations. Urgency for conservation: medium priority.
- L. levisanus:** Endangered; shrub; October; 3318CB/CD/DC, 3418AB/BA?/BB? Population status: once plentiful, it is now known from five relict patches in a region of major urban development, extending over a 15 km-long range. In 1981, one population had 442 plants next to a freeway; another of some 500 plants is in a military area; another had about 50 plants at a site for a township; five plants are under pressure from alien *Acacias* next to a freeway bridge; and two plants survive in the central area of a race-course. Cultivation: over 200 plants grown at the nursery of Provincial Nature Conservation were transferred to the Kirstenbosch Botanic Garden in 1985; it is also cultivated at the Adelaide Botanic Garden. Urgency for conservation: high priority.
- L. macowanii:** Endangered; shrub; May-July; 3418AB/AD. Population status: previously known from disjunct sites up to 25 km apart, the plant has been reduced largely by urban development to a single 2 km-long natural range. There are about 200 plants in the largest population, the others having 8, 5 and 7 individuals. Alien *Acacia* infestations still lie close to the largest population although many were removed in a clearing operation. The 8-plant population is in an area heavily trampled by cattle and has no seedlings. The other populations are fairly vigorous although seed-set is reduced by natural insect-attack and the population which is in a nature reserve consists of only male plants. In 1985 about half of the largest population was enclosed by a fence which forms part of the boundary of a Divisional Council nature reserve. Cultivation: grown at Kirstenbosch, to which the plants from the nursery of Provincial Nature Conservation were transferred in 1985; and at the Adelaide Botanic Garden in Australia. Seedlings grown by Kirstenbosch were planted in a Divisional Council Nature Reserve by the Reserve's staff in August 1984, at a probably safer habitat than the above, to which it is ecologically analogous. In July 1985 it consisted of 144 individuals. Urgency for conservation: high priority.

- L. modestum:** Vulnerable; shrub; August; 3419AC/BD/DA/DB. Population status: known from eleven population over a 120 km-long range. At one population the plants, which were the local dominants, were under pressure from heavy grazing and trampling by livestock; short-rotation burning for fresh fodder; ploughing; and alien *Acacia* infestation. A nature reserve is needed in this region for this and other threatened plants such as *Leucadendron elimense* ssp *elimense*. Urgency for conservation: high priority.
- L. nervosum:** Critically Rare; shrub; September; 3319DC
- L. nobile:** Critically Rare; shrub; September; 3323AB/BB/DB, 3324AD/CD
- L. olens:** Vulnerable; shrub; August-November (male plants flower almost throughout the year); 3322CC/CD. Population status: only known from populations totalling several hundred plants in a 12 km long part of a narrow valley. Threats: dense stands of *Hakea sericea* have threatened the populations but these are being removed by the Directorate of Forestry. Urgency for conservation: high priority.
- L. orientale:** Indeterminate; shrub; June-July; 3325CC/CD
- L. platyspermum:** Vulnerable; shrub; September; 3419AC/BC/DA/DB. Population status: known from at least 20 populations in an 85 km-long range. The plant grows vigorously and forms extensive stands. However, it is in a highly pressured area in the coastal lowlands and many of its sites have shown signs of decline. The plant is a favourite for picking for export. This removes a large percentage of the seed-store which is normally held for several years in the hard, woody cones. Being thus depleted, there is a risk that in some seasons' burns when the amount of seed is critical for regeneration, the plant's numbers may show a decline. Urgency for conservation: medium priority.
- L. radiatum:** Critically Rare; shrub; October-December; 3320DD, 3321CC. Population status: known from two places in 25 km-long range in a Wilderness Area. One of the populations is scattered along an area about 1 km long.
- L. remotum:** Critically Rare; shrub; August-September; 3119AA/AC. Population status: known from a single large population which has become fragmented by land-uses such as ploughing.
- L. roodii:** Endangered; shrub; August-September; 3118DA/DC/DD. Population status: known from a single population of only 20 plants which are under pressure from agriculture. Cultivation: Kirstenbosch is growing the plant and distributing seed to interested members of the public. It is critically urgent that some seed is placed in a seed-bank and used to increase the numbers in the nearly extinct natural population. Urgency for conservation: maximum priority.
- L. rourkei:** Critically Rare; shrub; December-January; 3322DB, 3323CB/DA/DB, 3324CA/CB/DA
- L. sericeum:** Endangered; shrub; May-September; 3219CA/CB/CC/CD. Threats: ploughing, road building.
- L. singulare:** Critically Rare; shrub; October; 3322DB. Population status: known from 100 ha of the summits of a mountain area. A ridge-top firebelt had been cleared through about half the population, and the other half was due to be cleared the following year when the problem was discovered. The firebelt has since been re-routed. The practice of making ridge/crown firebelts should be re-considered as summit ridges often are the habitat of endemics confined there by such factors as summer mists. Urgency for conservation: medium priority.
- L. sorocephaloides:** Vulnerable; shrub; August-September; 3323DB. Population status: formerly known from a few of the higher peaks over a 60 km long range. Some of the populations have been extirpated by too frequent and wrong-season fires and possibly also by grazing.
- L. spirale:** Extinct; shrub; November-January; 3319AC/CA
- L. stelligerum:** Vulnerable; shrub; July-August; 3419DA/DB

- L. thymifolium:** Endangered; shrub; August-September; 3318BC/DA. Population status: formerly evidently fairly widespread in a 20 km-long range. Now known from three populations: one with 300 plants; another with about 100 in a nature reserve which has been sold by a Divisional Council and advertised for abolition; and the third with 8 individuals. Threats include dense alien *Acacia* infestations, agricultural development, and possible genetic decline due to the small population-sizes. Cultivation: formerly grown at Kirstenbosch and at the nursery of Provincial Nature Conservation. Urgency for conservation: high priority.
- L. tradouwense:** Endangered; shrub; June; 3320CD/DC. Population status: formerly known from two places 35 km apart; further exploration has shown one additional site, but the plant may have been extirpated at the other two, which are in a well-explored area. The only population now known exists in a single large stand. Over-frequent or wrong-season fires appear to be a serious threat to the survival of this extremely localized plant. Urgency for conservation: high priority.
- L. verticillatum:** Endangered; shrub; September-October; 3318DD. Population status: once fairly widespread in a 30 km² area, now reduced to small relict patches due to ploughing up of natural vegetation for wheatlands. The largest known population lies in a 20 ha patch next to a nature reserve which recently escaped being ploughed by a few days, due to a conservation sociologist researcher having discovered the farmer's intention. Another population had about 150 plants in 1 ha, surrounded by ploughed lands and alien *Acacia* and Pine infestations. Urgency for conservation: high priority.
- Leucospermum arenarium (Proteaceae):** Vulnerable; shrub; July-October; 3218DA
- L. bolusii:** Vulnerable; shrub; September-December; 3418BB/BD. Population status: known as a population of several thousand plants in parts of an 11 km-long belt up to 100 m wide along a mountain slope. The belt is threatened in places with alien *Acacia*, *Hakea* and Pine infestations, by over-frequent or wrong-season fires, and in one area by urbanization. Urgency for conservation: low priority.
- L. catherinae:** Critically Rare; shrub; October-November; 3218BC/BD/DC, 3219CC, 3319AA
- L. cordatum:** Critically Rare; shrub; October-December; 3418BB/BD. Population status: known from a single population in a well-explored area. The population lies in a belt about 1.5 km along a mountain slope, no more than about 50 m wide and containing about 200 plants. The plants are vigorous. They grow near the site of a former manganese mine and may be confined to a manganese-rich soil: this should be studied. Potential threats include alien *Acacia* infestations some distance away and over-frequent or wrong-season fires: these should be regularly monitored. Urgency for conservation: high priority for regular monitoring.
- L. formosum:** Vulnerable; shrub; September-October; 3319DB, 3321DD, 3322CC/DC. Population status: previously known from five sites along 210 km of a mountain range; apparently extirpated at one of the sites, leaving the most remote one disjunct by about 190 km. The largest population has between 200 and 500 plants in an area of about 4 ha next to a Pine plantation. The plants are vigorous but seed production is somewhat low. Seedlings do not survive well. The population is being monitored by the Directorate of Forestry. Cultivation: the plant is very attractive with large catherine-wheel shaped inflorescences and would be valuable in cultivation. Urgency for conservation: medium priority.
- L. fulgens:** Vulnerable; shrub; August-November; 3420BC. Population status: the single known population occurs in a dense stand confined to a specialized habitat a few hundred metres wide on coastal sandy hillocks, over an area of several hectares. Grazing and invasive *Acacias* were reported in the vicinity when the site was visited in 1975.
- L. glabrum:** Critically Rare; shrub; August-October; 3322CD/DC/DD, 3323CC. Population status: known from sporadic populations in an 80 km-long area. The populations are often small, examples being 8, 50, 50 and 20 plants. Possible infestations by alien pines should be monitored. Cultivation: the plant has been successfully grown: it is seen in many gardens in the George area. Urgency for conservation: low priority for monitoring.
- L. gueinzii:** Critically Rare; shrub; August-December; 3318DD, 3418BB
- L. hamatum:** Critically Rare; shrub; August; 3322CC

- L. muirii:** Critically Rare; shrub; July-October; 3421AD/BA. Population status: known from a number of places in a 20 km-long area in the sandveld of the coastal lowlands where it escapes the more widespread agriculture of the finer soils of the wheat belt. In one population there were 50 plants in an area of 600 m², surrounded by ploughed land and with alien *Acacia* infestations nearby. Urgency for conservation: low priority for monitoring.
- L. mundii:** Critically Rare; shrub; July-November; 3320CD/DC, 3321CC. Population status: known from a few places in a 70 km-long part of a fairly well-explored mountain range. At one place there were about 100 plants in an area of 400 m² in a Forest Reserve. Future monitoring should take note of mild alien *Acacia* infestations in the vicinity. Cultivation: grown at Kirstenbosch. Urgency for conservation: low priority for monitoring.
- L. parile:** Vulnerable; shrub; July-November; 3318BC/CB/DA. Population status: known from a 20 km-long area in the heavily-threatened coastal lowlands, where it survives in at least ten relict patches of plants totalling several thousand. The plants are generally vigorous and in some areas may be becoming adapted to surviving in heavily disturbed areas, most unusual for a member of this family. All the known populations are threatened by dense *Acacia* or other alien plant infestations; some by extension of intensive farming and urban expansion. Cultivation: the plant with its rich yellow, perfumed inflorescences and vigorous growth is a good candidate for horticulture. Urgency for conservation: high priority.
- L. pluridens:** Critically Rare; shrub; September-December; 3321DA/DB, 3322CC. Population status: known from two rather remote areas in arid fynbos, about 40 km apart. One of the populations in one area was found to consist of 20 plants in 250 m². The plants appeared to lack vigour and few seedlings were seen. Urgency for conservation: low priority for monitoring.
- L. praecox:** Indeterminate; shrub; April-September; 3421BA/BC. Population status: known from a number of places in an 80 km-long area. The populations are often surrounded by alien *Acacia* infestations and are frequently threatened by ploughing. Cultivation: grown at Kirstenbosch, this attractive plant would be ideal for introduction to general horticulture. Further study: a better assessment of the population sizes and vigour is needed. Urgency for conservation: medium priority.
- L. profugum:** Endangered; shrub; September-December; 3218DC/DD
- L. secundifolium:** Critically Rare; shrub; September-December; 3321AC/AD/BC. Population status: known from two mountain areas 80 km apart. At one of two populations in one are there were 7 plants; at another there were up to a thousand extending over an area of several hectares. Possible threats which should be checked by monitoring are over-frequent fires and *Hakea* infestations. The plants are well-adapted to occasional fires, growing in dense, creeping mats which a fire does not penetrate more than at the edges: seedlings then appear along the burnt edge of the mat. The plant is of scientific interest and might serve as a dry-area ground-cover if it grows easily. Urgency for conservation: low priority for monitoring.
- L. tomentosum:** Vulnerable; shrub; July-November; 3319AA/AC/AD/BC. Population status: known from a 65 km-long area in the heavily threatened plant habitats of the western coastal lowlands, where it occurs in large populations of several thousand plants. The populations have shown extensive declines from alien *Acacia* infestations, ploughing and grazing by sheep. Urgency for conservation: low priority, higher if pressures show a significant increase in the region.
- L. winteri:** Critically Rare; shrub; November-January; 3321CD
- Leysera longipes (Asteraceae):** Critically Rare; shrub; December-January; 3319AA
- Lightfootia brachyphylla (Campanulaceae):** Uncertain; shrub; December-February; 3219CA/C, 3319AC/CC
- L. effusa:** Uncertain; shrub; April; 3319DC/DD
- L. microphylla:** Uncertain; shrub; February; 3420CA
- L. multicaulis:** Uncertain; perennial herb; December-January; 3219AA
- L. multiflora:** Uncertain; shrub; January, October; 3421AA/BA

- L. pauciflora:** Uncertain; shrub; January; 3321CC
- L. planifolia:** Uncertain; herbaceous shrub; January; 3321CC, 3421AA/AB
- L. squarrosa:** Uncertain; shrub; April; 3420CA, 3421AB
- L. umbellata:** Uncertain; shrublet; 3218AB
- Limonium acuminatum (Plumbaginaceae):** Vulnerable; shrublet; December; 3217DD, 3317BB, 3318AA/AC. Population status: known from scattered populations along a 40 km-long line of coast. In one population there were a few hundred plants along about 300 m of rocky shoreline. Threats in some areas include land development with consequent habitat degradation and trampling; a major population has been extirpated in this way. Many of the populations will be incorporated into a Nature Area. Urgency for conservation: low priority.
- L. capense:** Indeterminate; shrublet; November-December; 3217DD, 3317BB, 3318AA/AB. Threats: urban expansion.
- L. kraussianum:** Critically Rare; shrub; October-April; 3419DB, 3420AD/BC/CA
- L. namaquanum:** Uncertain; shrublet; October; 3017BC
- L. purpuratum:** Indeterminate; shrub; November-April; 3218CD, 3318AD/CD/DC
- L. teretifolium:** Uncertain; shrublet; June-September; 3118BC
- Liparia splendens (Fabaceae):** Uncertain; shrub; August-November; 3419AB/BC, 3420AB/CD, 3422AA
- Lithops comptonii (Mesembryanthemaceae):** Endangered; succulent; 3219DD, 3319BB. Threats: mining.
- L. divergens:** Vulnerable; succulent; all year; 2919AB, 3018CA/CD, 3118AB/BC/D. Threats: collecting.
- Lithospermum flexuosum (Boraginaceae):** Uncertain; shrub; 3220
- Lobelia capillipes (Lobeliaceae / Campanulaceae):** Uncertain; shrub; December-April; 3419DA/DB
- L. dasyphylla:** Uncertain; herb; January; 3320DC
- L. dichroma:** Uncertain; herb; November; 3222CD
- L. disperma:** Uncertain; herb; November; 3419AC/AD
- L. hypsibata:** Uncertain; annual herb; January; 3320DC
- L. laurentioides:** Uncertain; herb; December; 3419AD
- L. montaguensis:** Uncertain; herb; December; 3322CD
- L. nugax:** Uncertain; annual herb; January; 3319AD
- L. valida:** Indeterminate; perennial herb; September-March; 3420AD/BD. Population status: known from two areas 130 km apart. In one area, a small population was threatened by alien *Acacia* infestations and housing development. Further study: similar areas should be searched for more populations of the plant. Cultivation: this very beautiful plant is being grown at Kirstenbosch. Urgency for conservation: high priority.
- L. zwartkopensis:** Vulnerable; herb; October; 3325DC
- Lobostemon bolusii (Boraginaceae):** Endangered; shrub; October-November; 3418BB, 3419DA. Population status: known from one area, and possibly another 80 km away on sites for housing. Careful searching over a wide area in November 1980 indicated that only three plants survived to represent this species; a more recent search at the site revealed ten individuals. The species has been threatened and reduced by housing development, alien Pine and *Acacia* infestations, road building, trampling and quarrying. Urgency for conservation: maximum priority: almost extinct.

- L. collinus*: Uncertain; shrub; March-April; 3419DB, 3420CA
- L. gracilis*: Uncertain; shrub; September-October; 3319BD/CB/DD, 3420AA
- L. grandiflorus*: Critically Rare; shrub; February-April; 3419DA/DB, 3420BC/CA
- L. horridus*: Uncertain; shrub; April-May, September; 3320BC
- L. hottentoticus*: Vulnerable; shrub; July-October; 3119B, 3218B, 3418BB. Population status: known from three areas in a 350 km-long distribution range with disjunctions of 130 and 220 km. In one of the areas, the few populations that remain were under pressure from alien *Acacia* and Pine infestations, agriculture, forestry plantations, housing development, and fragmentation by roads and a railway. Further study: the other two populations should be surveyed. Urgency for conservation: medium priority.
- L. inconspicuus*: Uncertain; shrub; September; 3419DB
- L. lucidus*: Uncertain; shrub; August-October; 3323AD, 3419DB, 3420CA
- L. muirii*: Uncertain; shrub; February, July, October; 3320DC, 3321CC
- Lonchostoma esterhuyseniae* (Bruniaceae): Indeterminate; shrub; November; 3419BB
- L. purpureum*: Critically Rare; shrub; August-December; 3418BB
- Lotononis macra* (Fabaceae): Critically Rare; shrublet; September; 3219AC
- L. pallens*: Uncertain; shrublet; September; 3318CB
- L. viborgioides*: Critically Rare; shrublet; September-November; 3420AA, 3421AB, 3325CD?
- L. villosa*: Uncertain; shrublet; 3318BD
- Macrostylis barbiger* (Rutaceae): Critically Rare; shrub; July-December; 3218DB, 3219AC/CC, 3318BB
- M. cassiopoides* ssp *cassiopoides*: Critically Rare; shrub; September-November; 3218BD/DA
- M. cassiopoides* ssp *dregeana*: Rare; shrub; October-April; 3318BC/CB/DA/DC
- M. cauliflora*: Vulnerable; shrub; February-June; 3419DA/DB
- M. hirta*: Critically Rare; shrub; August; 3218BC
- M. ramulosa*: Critically Rare; shrub; March-September; 3219CA
- M. villosa* ssp *minor*: Endangered; shrub; May; 3318DD
- M. villosa* ssp *villosa*: Indeterminate; shrub; August; 3318BC/CD/DA/DC, 3418AB/AD
- Mairia decumbens* (Asteraceae): Uncertain; shrub; November-January; 3319CA, 3419AD
- Manulea glandulosa* (Scrophulariaceae): Uncertain; herb; September; 3118DC
- Marasmodes duemmeri* (Asteraceae): Indeterminate; shrub; June; 3318DC
- M. oligocephalus*: Uncertain; shrub; March-June; 3318AB/AD/BC/CB/DA/DB, 3319BC, 3419BD. Population status: previously known from a 50 km-long area in the much-threatened region of the western coastal lowlands, in which many of the populations of the plant have been severely reduced. In one population there were a few hundred plants in a 50 ha area badly infested with alien *Acacias*, often surrounded by ploughed lands and under pressure from grazing. Urgency for conservation: high priority.

- M. undulata:** Endangered; shrub; April-June; 3318DB. Population status: known from a single remnant of 300 plants in a 3 ha patch of renosterveld in the heavily threatened western coastal lowlands. Threats: the area is used as a camp-site and for recreation, with consequent trampling and soil compaction, perhaps flower-picking. Seeds are being stored in the Bolus Herbarium seed-bank. Cultivation: 20 plants grown in the nursery of Provincial Nature Conservation were transferred to the Kirstenbosch Botanic Garden in 1985. Urgency for conservation: maximum priority.
- Marsilea schelpeana (Marsileaceae):** Vulnerable; aquatic fern-ally; 3318DA, 3325DC/DD. Population status: known from a 15 km-long area in a region of extensive urban and agricultural development. Populations consist of many vigorous plants confined to shallow pans which may be old elephant-wallows. Threats include extension of urbanization and grazing by cattle. Further study: more pans should be visited in the region. Urgency for conservation: medium priority.
- Massonia laeta (Hyacinthaceae / Liliaceae):** Uncertain; geophyte; 3018AC
- M. nervosa:** Indeterminate; geophyte; June-August; 3217DD, 3318AB
- Matricaria schlechteri (Asteraceae):** Uncertain; shrub; August-October; 3017AD, 3218AB
- Maughaniella insignis (Mesembryanthemaceae):** Indeterminate; succulent; August-September; 3118CB
- Metalasia bodkinii (Asteraceae):** Uncertain; shrublet; September-October; 3419AA/AB/BA
- M. erectifolia:** Critically Rare; shrublet; December; 3420AD, 3421AD. Population status: known from two places 100 km apart, in the southern coastal lowlands. At one place, there were numerous plants in a few populations, one of which covered about 50 m², in a Provincial Nature Reserve. Urgency for conservation: low priority for monitoring.
- M. schlechteri:** Uncertain; shrublet; February; 3319AC
- M. tricolor:** Uncertain; shrublet; May; 3322CA
- Mimetes capitulatus (Proteaceae):** Critically Rare; shrub; September; 3418BB/BD, 3419AD/AC
- M. hirtus:** Critically Rare; shrub; July-December; 3318CD, 3418AD/BD, 3419AA/AD/DA
- M. hottentoticus:** Endangered; shrub; April-November; 3418BB/BD. Population status: occurs in three known populations from 9 to 59 plants, in Forestry-controlled areas. Cultivation: the plant is extremely attractive and has high horticultural potential. Urgency for conservation: high priority.
- M. palustris:** Critically Rare; shrub; August-January; 3419AD
- M. splendidus:** Vulnerable; shrub; September; 3320CD/DD, 3321CC/CD, 3322CC/DC/DD, 3323CC/DD. Population status: several populations, totalling less than 500 mature plants, are known over a 300 km long range. All are in Forestry-controlled areas. The populations consist of solitary plants or small groups up to about 50 individuals. Two populations are known to have been extirpated in the past three years. Plants have been destroyed, with no regeneration, by inappropriate burning regimes. The species is of scientific interest as it may be in a state of genetic decline with most of the populations consisting of only a few plants. As many as possible of the remaining populations should be conserved. Cultivation: the plant is attractive and has a high potential for use in horticulture. Urgency for conservation: high priority.
- M. stokoei:** Extinct; shrub; November-January; 3419AC
- Monadenia ecalcarata (Orchidaceae):** Vulnerable; geophyte; October; 3418AB
- M. macrostachya:** Uncertain; geophyte; November; 3018AC
- M. physodes:** Indeterminate; geophyte; September-October; 3018AC, 3318BC/CD, 3323DC, 3418BB
- M. pygmaea:** Uncertain; geophyte; September-November; 3318BC/CD, 3323DC, 3418BB

- M. sabulosa:** Critically Rare; geophyte; October-November; 3318CD, 3418AB/AD/BD
- Monopsis arenaria (Campanulaceae):** Uncertain; herb; January; 3319AD
- M. flava:** Uncertain; shrub; October-January; 3319AA/AC/AD
- M. stricta:** Uncertain; perennial herb; December; 3323C
- Moraea amissa (Iridaceae):** Endangered; geophyte; October; 3318BC. Seeds of this plant are being stored in the Bolus Herbarium seed-bank.
- M. aristata:** Endangered; geophyte; September-October; 3318CD. Population status: known from a single small area, now confined to a patch of about 20 plants from some 5 clones, in an area of about 30 m². The patch is among weedy composites, legumes and grasses and up to 1980 was regularly mown; some of the plants are shaded by alien Pines. The plants grow well but rarely set seed naturally. They produce abundant seed if they are pollinated by hand. Cultivation: the plant is grown at the Royal Botanic Gardens at Kew in the U.K.; at the Arboretum of the Irvine campus of the University of California; and at Kirstenbosch, to which plants from the nursery of Provincial Nature Conservation were transferred in 1985. Seeds are being stored in the Bolus Herbarium seed-bank. Urgency for conservation: high priority.
- M. barkerae:** Critically Rare; geophyte; September-November; 3219AC/CA/CC
- M. barnardii:** Vulnerable; geophyte; September-October; 3419AD/CB
- M. cooperi:** Vulnerable; geophyte; September; 3319AA, 3419AB/AD/BA
- M. debilis:** Vulnerable; geophyte; September-October; 3419AC/BA
- M. elsiae:** Critically Rare; geophyte; November-December; 3318CB/CD, 3418AD, 3420BC
- M. gigandra:** Endangered; geophyte; September; 3218DD. Population status: known from two populations in a single area, one of 18 plants, the other of about 300. Both occur in an intensively farmed part of a wheat-belt and strong land-demand may cause their habitat to be ploughed up at any time. Seeds are being stored in the Bolus Herbarium seed-bank. Cultivation: the plant would be a most attractive subject for horticulture: it is being grown at Kirstenbosch. It is critically urgent that a survival population be established in a nearby nature reserve. Urgency for conservation: maximum priority.
- M. incurva:** Extinct; geophyte; October; 3319AC
- M. indecora:** Critically Rare; geophyte; October; 2917DB
- M. insolens:** Endangered; geophyte; September; 3419AB/BA. Population status: known from a single population varying from about 150 to 240-300 plants in an area of about 0,5 ha. The area has had its alien plants (mainly Acacias) cleared regularly since 1979. About 11 000 seeds have been obtained by Provincial Nature Conservation for seed-banking and cultivation: some are being stored in the Bolus Herbarium seed-bank. Cultivation: grown at Kirstenbosch, to which plants from the nursery of Provincial Nature Conservation were transferred in 1985; the plant is also to be cultivated at the Caledon Wild Flower Garden. The plant should be established in a safer natural area near its present site. The plant is very attractive and would be a suitable subject for horticulture. Urgency for conservation: maximum priority.
- M. longiflora:** Critically Rare; geophyte; October; 3018AC
- M. loubseri:** Endangered; geophyte; August-September; 3318AA. Population status: known from a single population on a hilltop which has been partly quarried away. The population has been almost destroyed by this: in 1982 there were only 12 plants left, while for a few years none were evident, suggesting the species might have been made extinct. Quarrying may be resumed at any time. Cultivation: the plant, which has beautiful flowers and grows easily in cultivation, is being grown at Kirstenbosch; at the nursery of the plant's discoverer, Mr. J.W. Loubser, who has distributed seed to growers overseas; at the Pretoria National Botanic Garden; and at the San Diego Zoological Garden in California. The plant shows very limited variability in colour patterning in cultivation, suggesting that there may have been a loss of genetic variability. The plant should urgently be restored to a safe wild habitat. Seeds are being stored in the Bolus Herbarium seed-bank. Kirstenbosch has distributed seed to interested members of the public. Urgency for conservation: maximum priority.

- M. macgregorii*: Critically Rare; geophyte; October; 3119AC
- M. neopavonia*: Vulnerable; geophyte; September; 3218DD, 3318BB/DD, 3319AC
- M. nubigena*: Critically Rare; geophyte; September; 3319CD
- M. tulbaghensis*: Vulnerable; geophyte; September; 3318DB, 3319AA/AC. Seeds of this plant are being stored in the Bolus Herbarium seed-bank.
- Muraltia aciphylla* (Polygalaceae): Indeterminate; shrub; October; 3318DD
- M. angustiflora*: Indeterminate; shrub; October; 3319AB
- M. barkerae*: Vulnerable; shrub; August; 3421AB/AD
- M. calycina*: Vulnerable; shrub; August-September; 3420AD/CA
- M. capensis*: Uncertain; shrub; October; 3419AA
- M. carnosa*: Uncertain; shrub; October; 3322BC
- M. chamaepitys*: Critically Rare; shrub; April-May, September; 3419AA
- M. comptonii*: Critically Rare; shrub; October; 3418AB. Population status: known from a single area of a few hectares in a well-explored region. One population of about 150 matted plant-groups was growing in an area of 0,1 ha. For future monitoring, it should be noted that there are bad alien *Acacia* infestations in the same area. The plant is in the Cape Peninsula Nature Area. Urgency for conservation: medium priority for monitoring.
- M. concava*: Indeterminate; shrub; November; 3419BA
- M. cuspidifolia*: Indeterminate; shrub; April; 3419DA/DB
- M. ferox*: Indeterminate; shrub; September; 3319DC
- M. gillettiae*: Uncertain; shrub; September-October; 3419BC/BD
- M. guthriei*: Critically Rare; shrub; November; 3418BB
- M. harveyana*: Indeterminate; shrub; August; 3318AA/AC/AD
- M. hirsuta*: Indeterminate; shrub; September-October; 3419AD
- M. karroica*: Indeterminate; shrub; July; 3320DB, 3321CB/DA
- M. pottebergensis*: Critically Rare; shrub; October; 3419BA/BB, 3420BC. Population status: known from two places 80 km apart, separated by the belt of wheatlands in the southern coastal lowlands. One of the populations had numerous plants scattered over a large area in a nature reserve. Urgency for conservation: low priority for monitoring.
- M. satureioides* var *salteri*: Endangered; shrub; July-August; 3418AB. Population status: known from an area about 3 km long in a well-explored region. The plants form a sub-continuous population of perhaps a thousand plants, lying mostly on heavily *Acacia*-infested land. The infestation has been strengthened by massive seedling re-growth after past fires: another would cause a drastic decline of the plant's numbers. Other threats are trampling, flower-picking and habitat-degradation by squatters. A road has been made and a few houses are being erected in the plant's habitat. This profusely-flowered plant would be a valuable subject for horticulture. Urgency for conservation: high priority.
- M. serrata*: Uncertain; shrub; November; 3319CB
- M. spicata*: Uncertain; shrub; July; 3419BD/DA/DB
- Muiria hortenseae* (Mesembryanthemaceae): Endangered; succulent; January; 3222CB

- Myrica integra* (Myricaceae): Uncertain; tree/shrub; October-April; 3218BB?BD, 3318DB, 3319AD/CA/CC, 3418BB
- Nelia pillansii* (Mesembryanthemaceae): Indeterminate; succulent; October; 2816DD, 2817CD
- N. schlechteri*: Indeterminate; succulent; December, March; 2917AA
- Nemesia chrysolopha* (Scrophulariaceae): Critically Rare; annual herb; September; 3119BD
- N. glaucescens*: Uncertain; annual herb; 3018CB
- N. hastata*: Uncertain; herb; 3124BB
- N. micrantha*: Endangered; annual herb; October; 3418AB
- N. pallida*: Uncertain; shrub; 3222BC
- N. picta*: Critically Rare; annual herb; October-November; 3319CA
- N. strumosa*: Critically Rare; annual herb; September; 3318AB/AC/AD/BC/CB/DC
- Neopatersonia namaquensis* (Hyacinthaceae / Liliaceae): Critically Rare; geophyte; May-July; 3017BB
- N. uitenhagensis*: Uncertain; geophyte; September-October; 3325BC/BD/CD/DC
- Nerine breachiae* (Amaryllidaceae): Uncertain; geophyte; April-May; 3420AC/BC/CA. Population status: known from a 50 km-long area. One of the populations was in a Provincial Nature Reserve, with scattered plants extending over a 0,25 ha area, with large stands of alien *Eucalyptus* nearby. Further study: the taxonomic distinctness of this plant from *Nerine humilis* needs confirmation.
- N. peersii*: Uncertain; geophyte; April; 3322BC, 3323AC
- N. pudica*: Critically Rare; geophyte; April-May; 3319CA, 3419BA
- Nestlera tenuifolia* (Asteraceae): Uncertain; shrub; June, October; 3420AB, 3421AB
- N. tricephala*: Uncertain; shrub; September-October; 3319AA/AD/BC, 3320BA
- Nivenia concinna* (Iridaceae): Indeterminate; shrub; February-May; 3419AA
- N. dispar*: Uncertain; shrub; March; 3419BB
- N. fruticosa*: Uncertain; shrub; October, January; 3320DC/DD, 3321CC
- N. levynsiae*: Indeterminate; shrub; January-February; 3418BB/BD, 3419AC
- N. stokoei*: Critically Rare; shrub; February; 3418BD. Population status: known from a single dispersed population in a 4 km-long area extending from a botanical garden into a State Forest. Urgency for conservation: low priority, monitoring required.
- Oedera muirii* (Asteraceae): Uncertain; shrub; October; 3421AB
- Oldenburgia papionum* (Asteraceae): Critically Rare; shrub; December-March; 3319AC/CA. Population status: known from two disjunct sites 40 km apart in a well-explored mountain region. One population has about 150 plants over an area of about 1 ha in a State Forest. For future monitoring it should be noted that there should be no extension of plantations into the plant's habitat, particularly as it seems that shading should be avoided: the plants seem to require strong insolation. This interesting plant would be a valuable subject for horticulture. Urgency for conservation: low priority for occasional monitoring.
- Oophytum oviforme* (Mesembryanthemaceae): Indeterminate; succulent; August, March; 2917AA, 3118CB/DD

- Ophthalmophyllum australe (Mesembryanthemaceae):** Indeterminate; succulent; April; 3018DA
- O. haramoepense:** Indeterminate; succulent; April; 2918BA
- O. littlewoodii:** Uncertain; succulent; April-May; 2917BB
- O. longitubum:** Uncertain; succulent; March; 2917BB
- O. noctiflorum:** Uncertain; succulent; April; 2817CB
- O. spathulatum:** Uncertain; succulent; 2918CA
- O. vanheerdei:** Uncertain; succulent; March-April; 2919BA
- O. verrucosum:** Indeterminate; succulent; April; 2918DB
- O. villetii:** Indeterminate; succulent; April; 2920BC
- Ornithogalum bicornutum (Hyacinthaceae / Liliaceae):** Uncertain; geophyte; 3119CD
- O. deltoideum:** Uncertain; geophyte; September-December; 2820DC, 2917BD
- O. diluculum:** Uncertain; geophyte; 3320AD
- O. esterhuyseniae:** Critically Rare; geophyte; 3318DD, 3419AA
- O. geniculatum:** Critically Rare; geophyte; 2816BD, 2917BC/BD
- O. glandulosum:** Uncertain; geophyte; September; 2817AC, also S.W.A./ Namibia
- O. hallii:** Vulnerable; geophyte; November; 3118CB
- O. inclusum:** Uncertain; geophyte; September-October; 3119CC
- O. naviculum:** Uncertain; geophyte; December; 3118CB
- O. pilosum ssp pullatum:** Uncertain; geophyte; December; 3018AC, 3119BD
- O. pruinatum:** Critically Rare; geophyte; September; 2817CD, 2916BD, 3017BD, 3019AB, 3118DC
- O. rogersii:** Uncertain; geophyte; 3322CC/CD
- O. rupestre:** Vulnerable; geophyte; September-October; 3217DD
- O. thermophilum:** Uncertain; geophyte; December; 3218BB, 3219AC
- O. unifoliatum:** Uncertain; geophyte; October; 2917BB
- O. zebrinum:** Uncertain; geophyte; September; 2817CC/CD, 2917BA/BB/BD/DB, 3018AD
- Orothamnus zeyheri (Proteaceae):** Critically Rare; shrub; July-December; 3418BD, 3419AD. Population status: known from two areas a 45 km-long distribution range. In one area, there are 17 populations, mostly in a carefully managed State Forest; and in a nature reserve, another population, which is being re-established after a decline by planting seedlings. Total numbers of plants have fluctuated from 10 known in 1968 to 1 956 in 1972 and 1 213 in 1980. Seeds are being stored in the Bolus Herbarium seed-bank. Cultivation: grown at Kirstenbosch (9 plants), to which 50 plants from the nursery of Provincial Nature Conservation were transferred in 1985. Further study: an autecological study of the plant is being made by the Botanical Research Institute to assist with conservation planning for long-term survival of the plant. Potential threats to be watched in future monitoring include infection by *Phytophthora cinnamomi*; genetic decline due to small population-sizes; and the consequences of building a 200 million cubic metre dam in the State Forest which carries most of the plants. Urgency for conservation: high priority for continued monitoring.

Osteospermum aciphyllum (Asteraceae): Critically Rare; shrub; September-January; 3218DD, 3319CD, 3419AB. Population status: previously known from four populations, in two well-explored areas 170 km apart. At one of the sites the plant was found to be extirpated, evidently by massive infestations of alien Acacias, *Hakea* and Pines, together with extensive quarries for road-building gravel. Threats: road building, alien infestation. Further study: searches should be made for other populations. Urgency for conservation: high priority.

O. armatum: Uncertain; shrub; July-October; 2817CD, 2917BB, 2918CA, 2919AB, 2920BB

O. elsieae: Critically Rare; shrub; September; 3420BC

O. hafstroemii: Critically Rare; shrub; 3420CC

O. hirsutum: Extinct; shrub; 3318

O. hispidum var *viride*: Indeterminate; shrub; 3318DD

O. pterigoideum: Uncertain; shrub; November-May; 3322CD, 3424AB/BA

O. wallianum: shrub; October; 3418BB

Otholobium pungens (Fabaceae): Critically Rare; shrub; September; 3420BC

O. rubicundum: Uncertain; shrub; October-November; 3321AD

Othonna abrotanifolia (Asteraceae): Uncertain; shrub; September, March; 2917DB

O. cacalioides: Uncertain; shrublet; January-May; 3119AC

O. cakilefolia: Uncertain; herb; August; 3118AA/CB

O. hallii: Critically Rare; herb; July-September; 3118CB

O. lasiocarpa: Uncertain; shrub; July-August; 2917DA, 3320BA/BC

O. lepidocaulis: Uncertain; shrublet; July-December; 3021B, 3118AA

O. linearifolia: Uncertain; herb; September; 3320AB

O. membranifolia: Uncertain; shrublet; October-November, May; 3325CC/DD, 3424BB

O. minima: Critically Rare; herb; January-September; 3118DA

O. miser: Uncertain; shrub; May; 3222BB/DD, 3319CB

O. papaveroides: Uncertain; herb; September; 3118DA/DC/DD

O. pillansii: Uncertain; herb; October-May; 3119AC

O. pinnatifolia: Uncertain; herb; June-July; 3320BA/BC/DC

O. pteronioides: Critically Rare; shrub; August; 3320BA

O. rechingeri: Uncertain; herb; July; 3119AC

O. spinescens: Uncertain; shrub; March; 3123DD, 3320

O. tephrosioides: Uncertain; herb; July-August; 3218DA/DD, 3318BB, 3320BA

Oxalis anomala (Oxalidaceae): Uncertain; geophyte; May-July; 3320DC, 3321CA

O. attaquana: Uncertain; geophyte; March-June; 3322CA/CC

O. blastorrhiza: Uncertain; geophyte; July; 3118DA/DB

- O. burtoniae:** Indeterminate; geophyte; June; 3217DD, 3318AA
- O. callimarginata:** Uncertain; geophyte; July-August; 3319AA
- O. calvinensis:** Uncertain; geophyte; 3119BC
- O. cathara:** Uncertain; geophyte; June-August; 3017DD/DB, 3018CA/CC/CD
- O. ciliaris var pageae:** Uncertain; geophyte; April; 3320CC
- O. comptonii:** Uncertain; geophyte; May; 3118DC
- O. creaseyi:** Uncertain; geophyte; May-June; 3018AD
- O. crispula var crispula:** Uncertain; geophyte; April-May; 3118AB
- O. crispula var glandulosa:** Uncertain; geophyte; May-June; 3118AB
- O. crocea:** Uncertain; geophyte; June; 2917BA
- O. cuneata:** Uncertain; geophyte; May-June; 3018CC
- O. deserticola:** Critically Rare; geophyte; May-July; 3118BD/DB
- O. dichotoma:** Uncertain; geophyte; March-June; 3321BC/DA
- O. dines:** Uncertain; geophyte; June-August; 3119AA/CD, 3218BB/DB
- O. duriuscula:** Uncertain; geophyte; April-May; 3323CC/CD, 3419AB/AD, 3420CA
- O. extensa:** Uncertain; geophyte; March; 2820CB, 2920B
- O. fourcadei:** Uncertain; geophyte; October; 3322DB, 3323CA
- O. fragilis var fragilis:** Indeterminate; geophyte; May-June; 3318BA
- O. fragilis var pellucida:** Indeterminate; geophyte; May-July; 3318BA
- O. heidelbergensis:** Uncertain; geophyte; May-June; 3323DD, 3420BB
- O. henrici:** Uncertain; geophyte; April-May; 3319CC/DA
- O. involuta:** Critically Rare; geophyte; May-July; 3318BB, 3319AA/AB
- O. ioeides:** Uncertain; geophyte; May-June; 3322CC/DB
- O. lasiorrhiza:** Uncertain; geophyte; June; 3119AC
- O. levis:** Vulnerable; geophyte; June; 3318BC
- O. lichenoides:** Critically Rare; geophyte; June; 3018DC, 3118AB
- O. lindaviana:** Indeterminate; geophyte; June; 3218DB, 3319CB
- O. lineolata:** Indeterminate; geophyte; May-June; 3119CC, 3219AA
- O. luteola var minor:** Uncertain; geophyte; May-June; 3218DB
- O. marlothii:** Uncertain; geophyte; 3220AD
- O. massoniana var massoniana:** Uncertain; geophyte; May; 3119AC
- O. massoniana var flavescens:** Uncertain; geophyte; May-June; 3119AC/CA

- O. *melanograpta*: Critically Rare; geophyte; May-July; 3118BD
- O. *melanosticta* var *latifolia*: Uncertain; geophyte; May; 3119AC
- O. *microdonta*: Indeterminate; geophyte; May-June; 3320CA/CC
- O. *natans*: Endangered; aquatic geophyte; September-November; 3318CD, 3319AC/CB, 3418AB. Population status: known formerly from a wide range of wetland sites in a 120 km-long area. Extirpated from a number of sites and probably threatened in many others, only one possibly safe population exists, at the edge of a private nature reserve. The population here is small, covering no more than about 10 m², and could be lost due to genetic decline or some factor causing stochastic fluctuations. Further study: the distribution of this plant and many others should be studied as a part of a wetlands survey in the Western Cape Province, where it is evident that many such areas have been destroyed (see *Cadiscus aquaticus*). Urgency for conservation: maximum priority.
- O. *oligophylla*: Uncertain; geophyte; May; 3118DC
- O. *orbicularis*: Uncertain; February-June; 3320BC/CC/DA/DC
- O. *oreithala*: Uncertain; geophyte; July; 3118DC
- O. *oreophila*: Uncertain; geophyte; May-June; 3219AA
- O. *perineson*: Vulnerable; geophyte; June-July; 3318BA
- O. *porphyriosiphon*: Uncertain; geophyte; May-July; 3219AA
- O. *pulvinata*: Uncertain; geophyte; April-May; 3119AB
- O. *purpurata*: Uncertain; geophyte; May-June; 3119AC
- O. *reclinata*: Uncertain; geophyte; May-June; 3118AB
- O. *reclinata* var *gracillima*: Uncertain; geophyte; May-June; 3017BB/BD/DA, 3018AC
- O. *reclinata* var *quinata*: Uncertain; geophyte; June; 3018CC
- O. *rhomboidea*: Uncertain; geophyte; June-July; 3118AB
- O. *rubro-punctata*: Uncertain; geophyte; May; 3119CB
- O. *senecta*: Critically Rare; geophyte; June-July; 3018DC, 3118AD
- O. *simplex*: Uncertain; minute geophytic marsh plant; July-August; 3118C/DD, 3219AA. Population status: known from two nearby populations in a moderately well-explored region, on a private farm. One population had large numbers of this minute plant in wetter parts of a 100 m² area. A potential threat would be reduction of water-flow by extra usage at the farms upstream. Further study: more field-work is needed in the region to determine the plant's distribution. Urgency for conservation: medium priority.
- O. *stellata* var *gracillior*: Uncertain; geophyte; April; 3322CD
- O. *stellata* var *montaguensis*: Uncertain; geophyte; April-May; 3320AC
- O. *subsessilis*: Indeterminate; geophyte; June-July; 3317BB; 3318AA/AB
- O. *tenuis*: Uncertain; geophyte; May-June; 3118DC
- O. *virginata*: Critically Rare; geophyte; June-July; 3017DB

- Pachites appressa (Orchidaceae):** Indeterminate; geophyte; January; 3320DC
- P. bodkini:** Vulnerable; geophyte; December-January; 3124CB, 3319CA/CC, 3322CC/CD, 3418AB/BB/BD, 3419AA/AB/AC/BA, 3420CA. Population status: known from two disjunct areas 330 km apart in a well-explored region. Observation at one site has shown that above-ground growth and flowering are rare events which in this case occurred more than 20 years apart: they apparently require a particular combination of season of burn and rainfall. This problem gives plants such as this (especially some ground orchids) a spurious rarity. Nevertheless, the population studied seems to have been much reduced compared with one seen at the site some 90 years previously. Urgency for conservation: low priority.
- Pachypodium namaquanum (Apocynaceae):** Vulnerable; succulent; 2816BB, 2817AC, 2918BC/BD, 2919AA. Threats: illegal collecting.
- Paranomus abrotanifolius (Proteaceae):** Critically Rare; shrub; October-December; 3419DA/DB, 3420BC
- P. adiantifolius:** Critically Rare; shrub; November; 3319CD, 3419AA
- P. capitatus:** Critically Rare; shrub; November-January; 3319CD/DC. Population status: known from three populations in an area about 10 km long. At one population an extensive search revealed only 2 plants. Urgency for conservation: low priority, for occasional monitoring.
- P. centaureoides:** Critically Rare; shrub; September-October; 3321AC/AD
- P. esterhuyseniae:** Critically Rare; shrub; August-November; 3322DB, 3323DB, 3324CA/CB
- P. longicaulis:** Vulnerable; shrub; July; 3321DC/DD
- P. reflexus:** Critically Rare; shrub; May-September; 3325CB/CC/CD
- P. roodebergensis:** Critically Rare; shrub; May-November; 3321BC/CD/DA
- P. spicatus:** Critically Rare; shrub; August-November; 3418BB
- P. tomentosus:** Critically Rare; shrub; August-December; 3118DC, 3219AD/CA
- Passerina burchellii (Thymelaeaceae):** Critically Rare; shrub; January-February; 3319DC
- P. paludosa:** Endangered; shrub; September-November; 3318DD, 3418AB/BA. Population status: known from four populations in a 7 km-long area in moist places near the coast. In 1980 one population consisted of several hundred plants but a housing estate has been planned there; another, since wiped out by housing construction, had fifteen. The habitat is also threatened throughout by alien *Acacia* infestations. Urgency for conservation: high priority.
- Pauridia longituba (Hypoxidaceae):** Indeterminate; geophyte; May-June; 3217DB/DD, 3218CC
- Pelargonium appendiculatum (Geraniaceae):** Critically Rare; Shrublet; July; 3218DA, 3319
- P. caledonicum:** Critically Rare; geophyte; December-January; 3419AB
- P. ellaphieae:** Indeterminate; geophyte; November-December; 3418AB/BA
- P. hystrix:** Critically Rare; succulent; October-November; 3320BA/BB
- Pellaea robusta (Adiantaceae):** Uncertain; fern; 2917DD/DC/DB, 3017BB.
- Pentameris squarrosa (Poaceae):** Uncertain; perennial herb; 3419AA/BD
- Pentaschistis burchellii (Poaceae):** Uncertain; tufted perennial herb; 3422AA
- P. heterochaeta:** Uncertain; tufted perennial herb; 3119AA
- P. hirsuta:** Uncertain; tufted perennial herb; 3218BC

- P. zeyheri*: Uncertain; tufted perennial herb; 3318DD, 3325CD, 3418AB
- Pherolobus maughani* (Mesembryanthemaceae): Indeterminate; annual succulent; July, October; 3119BC/BD
- Phyllica affinis* (Rhamnaceae): Uncertain; shrub; May-November; 3119AC
- P. agathosmoides*: Uncertain; shrub; September; 3119AC
- P. alpina*: Uncertain; shrub; August; 3219AD
- P. altigena*: Uncertain; shrublet; August-October; 3219AA/AC
- P. amoena*: Uncertain; shrub; April; 3419DB
- P. ampliata*: Endangered; shrub; March; 3319AC
- P. anomala*: Uncertain; shrub; December; 3419AB
- P. apiculata*: Uncertain; shrub; April, August; 3419AB/BA
- P. barbata*: Uncertain; shrub; August-October; 3219AA/AC
- P. brachycephala*: Uncertain; shrub; November; 3320CD/DC
- P. brevifolia*: Critically Rare; shrub; July-October; 3419AB/BA, 3420BC
- P. burchellii*: Uncertain; shrub; March; 3419AB
- P. chionocephala*: Uncertain; shrub; September-January; 3219CC, 3319BA
- P. comosa*: Uncertain; shrub; December; 3319AC
- P. cuspidata*: Uncertain; shrub; September; 3218DA
- P. diosmoides*: Uncertain; shrub; May-July; 3419AA
- P. floribunda*: Uncertain; shrub; April-September; 3419CB, 3420CA
- P. fruticosa*: Critically Rare; shrub; August-September; 3219AA/AC/CA/CB. Population status: known from one area where three populations were found, each with scattered individuals in an area of about 50 m². Urgency for conservation: medium priority for occasional monitoring.
- P. glabrata*: Uncertain; shrub; lacks precise locality
- P. greyii*: Indeterminate; shrub; 3317BB
- P. guthriei*: Uncertain; shrub; May; 3319CC
- P. incurvata*: Uncertain; shrub; April; 3419DB
- P. laevifolia*: Uncertain; shrub; April; 3419DA/DB
- P. laevigata*: Uncertain; shrub; August-October; 3420AD, 3421AD
- P. laevis*: Uncertain; shrub; September-November; 3419AA/AB/BA
- P. lasiantha*: Uncertain; shrub; November; 3320C/D, 3420A/BC
- P. leipoldtii*: Uncertain; shrub; July-February; 3219AA/AC/CA. Population status: known from three places in a fairly well-explored area about 30 km long. At one place there were three populations of which one had about 50 plants extending over an area of 200 m². The population was somewhat distantly threatened by encroaching agriculture. Further study: the other populations should be surveyed. Urgency for conservation: low priority.

- P. levynsiae:** Uncertain; shrub; July-September; 3219AD/BC/CD, 3319BA/DC
- P. linifolia:** Uncertain; shrub; November; 3419AA
- P. longimontana:** Uncertain; shrub; November; 3321CC/CD
- P. lucens:** Uncertain; shrub; October, February; 3319DC
- P. lucida:** Uncertain; shrub; September; 3419AD/DB
- P. maximiliani:** Uncertain; shrub; August; 3219AA
- P. nigromontana:** Uncertain; shrub; November-May; 3321BD, 3322AC
- P. nodosa:** Uncertain; shrub; December; 3319CC
- P. parvula:** Vulnerable; shrub; June; 3419BD/DA/DB, 3420CA. Population status: known from three places in a poorly-explored area 15 km long. At one population there were scattered plants under pressure from grazing, alien *Acacia* infestations and ploughing. The plant forms part of the highly threatened Elim Dwarf Fynbos. Urgency for conservation: medium priority.
- P. pauciflora:** Uncertain; shrub; September, April; 3219AC/AB/AD/BC
- P. pearsonii:** Uncertain; shrub; December; 2917BC
- P. plumigera:** Critically Rare; shrub; September-October; 3219AA/AC/CA
- P. recurvifolia:** Uncertain; shrub; October; 3420AB
- P. retrorsa:** Uncertain; shrub; October-November; 3018AC
- P. reversa:** Uncertain; shrub; December; 3319CA
- P. salteri:** Uncertain; shrub; May; 3219CA
- P. schlechteri:** Indeterminate; shrub; June; 3318CD
- P. sericea:** Uncertain; shrub; December; 3321AD
- P. stenopetala:** Indeterminate; shrub; June; 3319AC
- P. trachyphylla:** Uncertain; shrub; November; 3319AA
- P. wittebergensis:** Uncertain; shrub; May-October; 3320BC/DB
- Phymaspermum schroeteri (Asteraceae):** Critically Rare; shrub; September-October; 3320BA
- Platycaulos cascadenis (Restionaceae):** (= *Restio cascadenis*, fide H.P. Linder, ined.); Critically Rare; tussock plant; September-April; 3418BB/BD. Population status: known from two parts of a 7 km-long area. In one part there is a potential threat of flooding by a large storage dam. In the other the plant is safe, growing on cliffs remote from most human-caused pressures. Urgency for conservation: low priority, for occasional monitoring.
- P. subcompressus:** (= *Restio subcompressus*, fide H.P. Linder, ined.); Indeterminate; tussock plant; October-December; 3319CA, 3418BB
- Pleiospilos kingiae (Mesembryanthemaceae):** Uncertain; succulent; May-June; 3323AC/CA
- P. leipoldtii:** Indeterminate; succulent; April-May; 3323CA
- P. prismaticus:** Endangered; succulent; March-April; 3118DA/DB, 3225BC, 3319AD/BA, 3320AB
- Podalyria cordata (Fabaceae):** Vulnerable; shrub; November; 3418BB

- P. tayloriana*: Vulnerable; shrub; September; 3322AC. Population status: a single population is known, consisting of several hundred plants in a 2 ha area. The area is regularly burnt and adjacent to a picnic site; a road and footpaths pass through the population. The species is attractive and should be brought into cultivation. Urgency for conservation: medium priority.
- Poellnitzia rubriflora* (Asphodelaceae / Liliaceae): Indeterminate; succulent; March-April; 3319DD, 3320AA/CC
- Polhillia waltersii* (Fabaceae): Indeterminate; shrub; July-September; 3319CB
- Polycarena capitata* (Scrophulariaceae): Indeterminate; annual herb; July-October; 3218DB, 3318CB/CD, 3320CC, 3418AB/CD
- P. gracilipes*: Uncertain; annual herb; 3020AD
- P. filiformis*: Uncertain; annual herb; October; 3119BC/BD
- P. minimum*: Uncertain; annual herb; November-January; 3018AC, 3119BC
- P. multifolia*: Uncertain; annual herb; May-September; 3322CD, 3420BC
- P. parvula*: Uncertain; annual herb; August-September; 3218AB, 3319AB
- P. sordidum*: Uncertain; annual herb; 3318AB
- Polygala dasyphylla* (Polygalaceae): Indeterminate; shrub; October; 3419DA/CB
- P. langebergensis*: Indeterminate; shrub; July-October; 3321CC
- P. lasiosepala*: Uncertain; shrub; September-November; 3017BB, 3018AC, 3118DC
- P. pottebergensis*: Indeterminate; shrub; August-April; 3420BC/BD. Population status: known from numerous scattered groups of plants in a 10 km-long area in a Provincial Nature Reserve. Further study: all the populations should be surveyed. Urgency for conservation: low priority.
- Priestleya elliptica* (Fabaceae): Indeterminate; shrub; September-December; apparently all population sites are under severe threat from alien vegetation. 3318DD, 3319CC, 3418BB, 3419AB
- P. glauca*: Indeterminate; shrub; August-September; 3318CD/DD, 3418AB, 3419AA
- P. guthriei*: Uncertain; shrub; July; 3419DA/DB
- P. laevigata*: Uncertain; shrub; September-January; 3218DA, 3318CD/DC?, 3418AB/BB
- P. leiocarpa*: Uncertain; shrub; September; 3318DD
- P. myrtifolia*: Uncertain; shrub; March-July; 3319CB/CC, 3418BB, 3419AA. Population status: known from six places in a 20 km-long area. At one place it was found to be very rare. The other places should be surveyed. Urgency for conservation: low priority.
- P. rogersii*: Uncertain; shrub; 3319CB
- P. schlechteri*: Uncertain; shrub; August-September; 3119AC
- P. stokoei*: Indeterminate; shrub; August-January; 3318DD, 3319AC/CC, 3418BB
- P. tecta*: Critically Rare; shrub; June-September; 3319AA/AB/AC/CA/CC/CD, 3325CC, 3419BC/DA
- P. thunbergii*: Uncertain; shrub; December; 3418BB
- P. tomentosa*: Critically Rare; shrub; July-February; 3318CD, 3319BC/DD, 3320CB, 3418AB/BD
- Prionanthium ecklonii* (Poaceae): Uncertain; annual grass; 3218BB/DD, 3319AC

- P. pholiuroides:** Endangered; annual grass; October; 3318BC/DA. Population status: known from a few disjunct sites in a 60 km-long area. At one population there were several thousand plants confined to a few, small pan-like depressions with standing surface water in winter, a rare habitat in the region. The surroundings of the pans were heavily infested with alien Acacias. Urgency for conservation: medium priority.
- P. rigidum:** Uncertain; grass; 3119A
- Prismatocarpus cordifolius (Campanulaceae):** Critically Rare; perennial herb; after fire; 3418BD, 3419AC
- P. decurrens:** Uncertain; herb; December-March; 3219AC. Population status: known from two places in a fairly well-explored mountain region. At one there were about 100 plants extending over 8 ha. Further study: the area should be more fully surveyed for this plant. Urgency for conservation: low priority.
- P. fastigiatus:** Uncertain; shrublet; December; 3118CA
- P. hispidus:** Uncertain; shrublet; January-May; 3321DD, 3322CC
- P. implicatus:** Uncertain; herb; February-May; 3319AA/AD
- P. pauciflorus:** Uncertain; herb; January-February; 3119AC, 3219AA
- P. pilosus:** Uncertain; shrublet; January-April; 3219CB/CD
- Protea angustata (Proteaceae):** Vulnerable; shrub; July-August; 3319AC, 3418BD, 3419DB
- P. aurea ssp potbergensis:** Vulnerable; shrub; May-October; 3420BC
- P. convexa:** Critically Rare; shrub; August-October; 3320BA/BC. Population status: known from dispersed sites on a 30 km-long mountain range. Population sizes vary from 1 to 35 plants. Urgency for conservation: low priority for occasional monitoring.
- P. holosericea:** Endangered; shrub; September; 3319DA. Population status: known from two populations in a single mountain area in a moderately well-explored region. In 1982 one population had about a thousand plants, the other about 500. Over two years a farmer removed 20 632 flower-heads for export overseas. This has been stopped by Provincial Nature Conservation. The plant recovered well after a severe fire in 1972. Over-frequent fires which would outstrip the ability of the plant to set seed would seem to be unlikely due to the sparseness of the surrounding high-altitude, arid fynbos. Cultivation: the plant is being grown at Kirstenbosch to which plants from the nursery of Provincial Nature Conservation were transferred in 1985. The Directorate of Forestry has established a plot to monitor the plant's population dynamics. Urgency for conservation: high priority.
- P. inopina:** Critically Rare; shrub; September-December; 3218DB
- P. lanceolata:** Vulnerable; shrub; July-September; 3322CC, 3420BC/BD, 3421AA/AB/BB. Population status: known from a 160 km-long area; the plant usually grows close to the coast where it is being very widely extirpated by alien *Acacia* infestations. At an inland site a sample population was being heavily threatened by ploughing, alien vegetation and grazing. The plant is of potential value as a windbreak in windy coastal areas with impoverished soils. Urgency for conservation: maximum priority.
- P. mucronifolia:** Critically Rare; shrub; October-January; 3319AC. Population status: known formerly from a 20 km-long area; now confined to two nearby populations, one of which has about a thousand plants extending over a few hectares, in a private nature reserve. Urgency for conservation: medium priority, for continued monitoring.
- P. odorata:** Endangered; shrub; March-June; 3318BC/DA/DD. Population status: known from a 45 km-long area, in the heavily threatened remnant vegetation of the western coastal lowlands. In 1982 the largest population had 413 plants in a 3 ha area. This population was having most of the young, sweet-tasting inflorescences eaten off by livestock: only 50 fruiting heads and 12 flower-heads were left out of what should have been thousands. The population was being trampled; some plants were dying, probably from a fungal infection; and the plants were barely

surviving in glades among dense alien *Acacia* infestations. Another population of 20 plants was destroyed between 1979 and 1982 by over-frequent or wrong-season fires and perhaps by trampling and browsing of young flower heads by sheep. A third population of only 3 plants succumbed in 1983 to alien *Acacia* infestation and garbage dumping. A fourth population of a few plants is to be confirmed on an isolated hill of fynbos about 33 km away. A fifth population of a few dozen plants has been reported in a heavily *Acacia*-infested nature reserve which a local authority has sold and is trying to get abolished. A sixth population was apparently wiped out several years ago by extensive road-works. The student's Botany Club of the University of Cape Town has cleared and fenced off part of the largest population with the aid of funds from the Southern African Nature Foundation. In January 1985 a fire burnt about half the plants and recovery from fire is being studied. Seed-bank: there are about 100 seeds in the Bolus Herbarium seed-bank. Cultivation: 133 plants were sent in 1985 to Kirstenbosch from the nursery of Provincial Nature Conservation. The plant is of scientific interest. Urgency for conservation: maximum priority.

- P. pityphylla:** Vulnerable; shrub; May-August; 3319AD. Population status: known from a 30 km-long area with numerous small populations. One had about 50 scattered plants in an area of about 1 ha. This population, which is probably more under pressure than most, was threatened by alien *Acacia* infestations and perhaps in the future by road-widening. Cultivation: the plant has highly ornamental flower-heads and is a popular garden plant. It is grown at Kirstenbosch. Urgency for conservation: medium priority for monitoring.
- P. pruinosa:** Critically Rare; shrub; January-April; 3321AC/AD, 3322BC
- P. pudens:** Vulnerable; shrub; May-September; 3419AC/DA/DB
- P. vogtsiae:** Indeterminate; shrub; August-November; 3323CD/DA, 3324CA
- Pseudobaeckea stokoei (Bruniaceae):** Critically Rare; shrub; August-September; 3419AD
- Psoralea bolusii (Fabaceae):** Indeterminate; shrub; October; 3218DB/DC/DD
- P. glaucinia:** Indeterminate; shrub; December; 3318DC, 3419AB
- P. keefii:** Uncertain; shrub; January-February; 3322DD
- P. macradenia:** Indeterminate; shrub; July-August; 3322AA/AC/BC
- P. odoratissima:** Uncertain; shrub; October-November; 3320CC
- P. patersoniae:** Uncertain; shrub; December; 3325DC
- P. striata:** Uncertain; shrub; December; 3017BD, 3218DB, 3321DA/DC, 3322CA
- P. venusta:** Indeterminate; shrub; October-November; 3317BB
- Pteronia inflexa (Asteraceae):** Uncertain; shrub; October, April; 3118AB, 3221BA/BB
- P. pillansii:** Uncertain; shrub; December; 3017BD, 3118AB
- P. scabra:** Uncertain; shrub; December; 3419AA/DA/DB
- P. tenuifolia:** Uncertain, shrub, November-December; 3419AC/AD/DA/DB
- Pterothrix cymbifolia (Asteraceae):** Uncertain; shrub; 3118AB
- P. flaccida:** Uncertain; shrub; December-January; 3018BA; 3319CB
- P. perotrichoides:** Uncertain; shrub; November-April; 3318DD; 3319AB; 3320BA
- Pterygodium connivens (Orchidaceae):** Indeterminate; geophyte; October-November; 3418AD
- P. newdigateae var cleistogamum:** Critically Rare; geophyte; September-December; 3323CD/DD, 3423AA

- P. newdigateae** var **newdigateae**: Indeterminate; geophyte; November; 3323CD
- P. pentherianum**: Indeterminate; geophyte; September-October; 3218BB/DD, 3219AB/AC
- Rabiea jamesii** (Mesembryanthemaceae): Indeterminate; succulent; July-August; 3225BA
- Rafnia crispa** (Fabaceae): Indeterminate; perennial herb; December; 3319AC
- R. ericifolia**: Indeterminate; shrublet; December-March; 3318DB/DD
- Raspalia barnardii** (Bruniaceae): Indeterminate; shrub; November-December; 3320CD
- R. schlechteri**: Critically Rare; shrub; November-December; 3321CC/CD
- Relhania conferta** (Asteraceae): Uncertain; shrub; December; 3018AC
- R. foveolata**: Critically Rare; shrublet; September; 3319BC
- R. latifolia**: Uncertain; shrub; September; 3218DA/DD
- R. patersoniae**: Uncertain; shrublet; September-October; 3322CC, 3323AC/C/DB, 3324CA/CB/DA
- R. resinifera**: Critically Rare; shrub; August-October; 3222BC, 3320AD/DB
- R. rotundifolia**: Endangered; shrub; October-November; 3318AB/BC/DA. Population status: formerly known from a 50 km-long area in relicts of the heavily-threatened vegetation of the coastal lowlands. The plant's habitat of seasonally wet flats has almost disappeared due to agricultural development. The plant was believed extinct in 1972. It has since been found in a single population of some 1 500 plants in an area which has been purchased by Provincial Nature Conservation for a reserve. The area has rapidly-increasing alien *Acacia* infestations, a history of over-frequent or wrong-season fires, ploughing for wheat in an up-slope section, and probably rising salinization from fertilizer residues accumulating in the area. Urgency for conservation: maximum priority.
- R. silicicola**: Critically Rare; shrublet; September-October; 3118CB
- R. spathulifolia**: Critically Rare; shrublet; September-October; 3419DB
- R. steyniae**: Vulnerable; shrub; October-March; 3421AC/AD. Population status: known from two populations on limestone. One of the populations is threatened by alien *Acacia* infestations and spreading urbanization with roads for township development being made into the area. Urgency for conservation: medium priority.
- Restio acockii** (Restionaceae): Endangered; tussock herb; March-May; 3318BC/DA/DC. Population status: recorded from two disjunct sites 45 km apart in the heavily threatened remnants of the vegetation of the western coastal lowlands. The plant has been extirpated by urban development at one site and survives as a population of several thousand extending over an area of about 5 ha. The habitat is under threat from alien *Acacia* infestations; probably over-frequent fires; and possible salinization from fertilizers used on neighbouring land. Seeds are being kept in the Bolus Herbarium seed-bank and at Wakehurst Place in the U.K. The area where the plant occurs has been purchased by Provincial Nature Conservation for a reserve. The plant is of scientific interest as a distinctive species in its genus. Urgency for conservation: high priority.
- R. aureolus**: Indeterminate; tussock plant; December; 3319AD
- R. brunneus**: Critically Rare; tussock plant; January-December; 3219AA/AC
- R. distans**: Critically Rare; tussock plant; October-January; 3418BB, 3419AA
- R. dodii** var **dodii**: Critically Rare; tussock plant; December; 3418AB/AD. Population status: known from three populations in a 6 km-long area in a Divisional Council Nature Reserve. Each population carries numerous clumps of the plant, some dispersed over several hectares. Urgency for conservation: low priority: occasional monitoring required.

- R. dodii* var *purpureus*: Critically Rare; tussock herb; 3419DA/DB/DD, 3420CB
- R. festucaeformis*: Vulnerable; tussock herb; 3419AA/AB/AC/BA/BD/DA
- R. filicaulis*: Uncertain; tussock plant; October; 3319AD
- R. fusiformis*: Critically Rare; tussock plant; April-June; 3418BB/BD
- R. harveyi*: Vulnerable; tussock herb; April; 3318CD, 3418AB/BB, 3419DA/DB/DD
- R. involutus*: Critically Rare; tussock plant; March-April; 3418BB
- R. micans*: Endangered; tussock herb; July-September; 3318BC/CD/DA. Population status: known from marshy depressions, a now-rare habitat, in two disjunct places 55 km apart. Formerly known from five places in the region. In one population, in a fynbos relict in the centre of a race-course, there were several hundred plants in a 0,1 ha patch in 1979. The patch was having cut brushwood dumped in it; it has been trampled by horses and people; a road next to it may be widened; more jumps may be erected in the fynbos patch in the future; and invasive alien plants nearby include Acacias, Lupins and *Sesbania*. In another population, there were several thousand plants in an area threatened by increasing infestations of Acacias, and possibly over-frequent fires. Urgency for conservation: high priority.
- R. papyraceus*: Critically Rare; tussock plant; October-December; 3321AC/AD/BC/BD
- R. scaber*: Vulnerable; tussock herb; April; 3419AB/BA
- R. tuberculatus*: Uncertain; tussock plant; July, August, December; 3219AA/AC
- R. vilis*: Critically Rare; tussock plant; 3017BB, 3018AC
- Rhigiophyllum squarrosum* (Campanulaceae): Uncertain; shrub; November-February; 3419BC/DA/DB, 3420CA
- Rhinephyllum inaequale* (Mesembryanthemaceae): Indeterminate; succulent; November-February; 3224BC/DA
- Roella bryoides* (Campanulaceae): Uncertain; shrublet; November-February; 3018AC, 3318DA, 3319CD, 3419AB/BA
- R. cuspidata* var *hispida*: Uncertain; shrub; January-February; 3419AD, 3420CA
- R. goodiana*: Indeterminate; shrub; January-February; 3418AB
- R. latiloba*: Uncertain; shrublet; November; 3218BC, 3421AB
- R. lightfootioides*: Uncertain; shrublet; February; 3419AA/AB
- R. rhodantha*: Critically Rare; shrublet; September-November-April; 3420BC. Population status: known in a few populations on the lower slopes of a coastal mountain in a Provincial Nature Reserve. Further study is needed of this plant's distribution range.
- Romulea albomarginata* (Iridaceae): Critically Rare; geophyte; 3219CA/CC/CD
- R. amoena*: Critically Rare; geophyte; August; 3119AC/AD/CA
- R. aquatica*: Vulnerable; aquatic geophyte; August-September; 3218DD, 3318AB/BA
- R. barkerae*: Critically Rare; geophyte; July; 3217DD
- R. biflora*: Critically Rare; geophyte; July-September; 3118DA, 3219AA. Population status: known from an 80 km-long area in very arid fynbos similar to renosterveld. At one population a few hundred plants extended over 1 ha, flowering well after a recent fire. Browsing by goats might be a threat to the plant. Urgency for conservation: low priority: occasional monitoring required.

- R. cedarbergensis:** Uncertain; geophyte; September; 3219AA/AD
- R. elliptica:** Vulnerable; geophyte; August; 3217DD
- R. eximia:** Vulnerable; geophyte; August-September; 3318AD
- R. hallii:** Uncertain; geophyte; June-August; 3220BC/DA
- R. jugicola:** Critically Rare; geophyte; August; 3322CD/DA/DC
- R. kamisensis:** Critically Rare; geophyte; August-September; 3017BB, 3018AC
- R. komsbergensis:** Uncertain; geophyte; August-September; 3220BC/DB
- R. malaniae:** Uncertain; geophyte; August; 3319DB
- R. membranacea:** Uncertain; geophyte; August; 3120CA
- R. monadelpha:** Indeterminate; geophyte; July-August; 3119AC/BC/BD
- R. multifida:** Critically Rare; geophyte; August; 3220BC/DB
- R. multisulcata:** Indeterminate; geophyte; August-October; 3119AC/CA
- R. namaquensis ssp bolusii:** Uncertain; geophyte; July-August; 3017BB/BD
- R. namaquensis ssp namaquensis:** Uncertain; geophyte; July-September; 3017BB
- R. oliveri:** Uncertain; geophyte; September; 3018AC
- R. papyracea:** Extinct; geophyte; October; 3318CD
- R. saldanhaensis:** Vulnerable; geophyte; August-September; 3218CC, 3318AD
- R. sanguinalis:** Critically Rare; geophyte; August; 3119CA
- R. sinispinosensis:** Uncertain; geophyte; August; 3118CC
- R. sladenii:** Critically Rare; geophyte; August-September; 3118DB/DC/DD
- R. sphaerocarpa:** Indeterminate; geophyte; June; 3319BD/DB
- R. sulphurea:** Extinct; geophyte; August; 3219AA
- R. syringodeoflora:** Critically Rare; geophyte; September-October; 3220BC/DA/DB
- R. tortilis var dissecta:** Critically Rare; geophyte; July-September; 3018DD, 3218DB
- R. tortilis var tortilis:** Critically Rare; geophyte; August-September; 3219CC, 3319AA
- R. toximontana:** Critically Rare; geophyte; August; 3118DC, 3119AC
- R. vinacea:** Critically Rare; geophyte; August; 3218BB/BD, 3219AA
- R. viridibracteata:** Uncertain; geophyte; August-September; 3119AC, 3219AA
- R. vlokii:** Critically Rare; geophyte; July-August; 3322DB
- Roridula gorgonias (Roridulaceae):** Critically Rare; shrublet; September-October; 3418BB, 3419AA/AB/AC/AD/BC
- Rosenia angustifolia (Asteraceae):** Uncertain; shrub; September; 3119BB, 3320BA
- R. glandulosa:** Uncertain; shrub; September-October; 3119BD

- Ruschia amicorum** (Mesembryanthemaceae): Critically Rare; succulent; May-August; 3319CB, 3320CC/DC/DD, 3321AD, 3421AD
- R. filamentosa**: Indeterminate; succulent; May-August; 3318CD, 3418AB
- R. firma**: Critically Rare; succulent; July-August; 3118DA, 3318AD. Population status: known from two disjunct sites 190 km apart in a well-explored region. One population had about 20 plants in an area of 100 m². Potential threats which should be monitored at this site are alien *Acacia* invasion from infestations in the vicinity, and possible future development of agriculture. Urgency for conservation: low priority; occasional monitoring required.
- R. leipoldtii**: Endangered; succulent; August-October; 3319CB/DA/DB/DD, 3320CC/CD/DC, 3419BB, 3420AA
- R. promontorii**: Endangered; succulent; June-July; 3418AD. Population status: known from a single population on an exposed headland. Of the areas which were accessible, about 24 plants were seen, extending over an area of about 100 m². Genetic decline is possible due to the very small size of population; another insidious threat would be a stochastic fluctuation in the population-size due to a change in a critical habitat factor. Urgency for conservation: low priority.
- R. rubricaulis**: Indeterminate; succulent; June-September; 3317BB, 3318CD, 3418AB
- Saphesia flaccida** (Mesembryanthemaceae): Endangered; succulent; November-December; 3318BC/DA. Population status: known from two disjunct areas 110 km apart. At one area a nature reserve was made for one of the two populations. The plant can no longer be found at the reserve, which was allowed by a Divisional Council to become partly overgrown with alien *Acacia* infestations. It was sold by auction to a private bidder in 1984 and a request made by the Divisional Council to have its reserve-status abolished. This request has been refused and the reserve is to revert to public ownership. The reserve has two other Endangered, high-priority plants on it, *Protea odorata* and *Leucadendron thymifolium*. Another population has 11 plants in an area of 0.25 ha, threatened by spreading thickets of alien *Acacias*, trampling and grazing by sheep, and over-frequent fires: this forms part of an area which has been purchased by Provincial Nature Conservation for a reserve for this and some 30 other threatened species. Cultivation: this is a most attractive plant with a large white flower, a good candidate for horticulture. Urgency for conservation: maximum priority.
- Satyridium rostratum** (Orchidaceae): Vulnerable; geophyte; November-December; 3318CD, 3418AB/BD, 3419AA. Population status: known in the past from a few, scattered small populations in marshes in a 70 km-long range. It has not been seen for many years in well-studied former localities. Low-altitude localities are under pressure from alien plant encroachment and urban development. Urgency for conservation: medium priority.
- Satyrium foliosum** (Orchidaceae): Critically Rare; geophyte; January-February; 3318CD, 3418BB. Population status: known from three disjunct sites at the summits of mountains 50 and 20 km apart. One site lies in the Cape Peninsula Nature Area and two others are in State Forestry areas. At one site in some years no plants can be seen (but may be dormant as buried tubers): at other years there have been up to 50. The plant is of scientific interest. Urgency for conservation: low priority.
- S. muticum**: Vulnerable; geophyte; August-September; 3321DD, 3421BA/BC, 3422AA, 3423AA/AB. Population status: known from four places in a 150 km-long, well-explored area in the heavily threatened vegetation of the southern coastal lowlands. Urgency for conservation: medium priority.
- Sceletium expansum** (Mesembryanthemaceae): Indeterminate; succulent shrublet; September-October; 3323AC/AD
- S. ovatum**: Indeterminate; succulent shrublet; July-August; 3320BB/CC?
- Schizodium longipetalum** (Orchidaceae): Vulnerable; geophyte; August-September; 2917DB, 3218D, 3318DD, 3319CA

- S. obliquum ssp obliquum:** Vulnerable; geophyte; July-October; 3318CD, 3418AB/D. Population status: previously known from four disjunct places up to 65 km apart, partly in the highly threatened vegetation of the western coastal lowlands. Both populations at one place have been extirpated by urban growth and another is suspected to have been lost. A problem is that the plant is not easily seen but it grows in a well-explored region. One population surveyed had a few plants in an area of about 0,25 ha: this and a few other populations were in a Divisional Council Nature Reserve. Urgency for conservation: low priority.
- Schwantesia acutipetala (Mesembryanthemaceae):** Indeterminate; succulent; July; 2817AC
- S. australis:** Indeterminate; succulent; July; 2918BB, 2919AA
- S. pillansii:** Indeterminate; succulent; December-June; 2919AB/AC/BB
- S. speciosa:** Indeterminate; succulent; June; 2818CC, 2917BB
- S. triebneri:** Indeterminate; succulent; April-June; 2919AB/AC
- Scilla plumbea (Hyacinthaceae / Liliaceae):** Critically Rare; geophyte; December; 3319CA. Population status: known from two populations in two adjacent river valleys a few kilometres apart in a mountain range. One population had several hundred plants scattered singly or in clumps over an area of 0,75 ha in a State Forest Reserve. Cultivation: an attractive plant which would be a valuable subject for horticulture. Urgency for conservation: low priority: occasional monitoring required.
- Scirpus delicatulus (Cyperaceae):** Indeterminate; perennial herb; October-December; 3318CD, 3319CB, 3418AB
- Scopelogenia veruculata (Mesembryanthemaceae):** Critically Rare; succulent; October-November; 3318CD, 3418AB
- Secale africanum (Poaceae):** Indeterminate; tussock herb; December-February; 3220BC
- Selaginella pygmaea (Selaginellaceae):** Uncertain; annual herb; October-November 3418AB, 3419AD, 3421AB
- Senecio addoensis (Asteraceae):** Uncertain; perennial herb; April; 3325DA
- S. albopunctatus:** Uncertain; perennial herb; August-September; 2917BA
- S. anthemifolius:** Uncertain; perennial herb; July; 3419AC, 3420AB
- S. diodon:** Uncertain; perennial herb; September-December; 3218BB, 3225BA, 3319AA, 3323CA
- S. erysimoides:** Uncertain; annual herb; August; 3320BA/BB/BC
- S. expansus:** Uncertain; perennial herb; January; 3318DB, 3319CA
- S. foeniculoides:** Indeterminate; herb; January-March; 3318CD/DC, 3319AA, 3418AB
- S. haworthii:** Uncertain; succulent shrublet; October-November; 3223DC/DD, 3320BA/BB/BC
- S. hirtellus:** Uncertain; shrublet; November-January, June; 3325DC
- S. microspermus:** Uncertain; shrublet; September; 3325DD, 3421A/B
- S. muirii:** Uncertain; herb; April; 3421AB
- S. rehmanni:** Uncertain; perennial herb; January, April; 3319BC/CB, 3320CD
- S. serrurioides:** Uncertain; shrublet; October, May; 3325CC
- S. succulentus:** Uncertain; succulent shrublet; August-October; 3319BC/CD

- S. thunbergii*: Uncertain; herb; September; 3318CD
- S. trachylaenus*: Uncertain; annual herb; June-August; 2917BA/BC/BD
- S. trachyphyllus*: Uncertain; annual herb; November; 3419AC/AD
- Serruria aemula* (Proteaceae): (= *Serruria ciliata* R.Br.); Endangered; shrub; September-November; 3318CB/CD/DC/DD, 3418BA. Population status: previously widespread in a 30 km-long area in the now heavily threatened natural vegetation of the western coastal lowlands, it is at present known from five isolated, small remnants. The numbers of plants in the populations differ greatly, there being not more than 600 in total. At all the sites there are high densities of alien Acacias which are spreading rapidly; in addition there is disturbance by trampling, over-frequent or wrong-season fires, road-building, laying of drainage pipes, and industrial and housing development. Cultivation: the plant is very attractive with masses of bright pink inflorescences, and it grows easily from seed. Urgency for conservation: maximum priority.
- Serruria brownii*: Vulnerable; shrub; September-October; 3318BC/CB/DB/DC/DD. Population status: known from two areas 45 km apart, in the heavily threatened natural vegetation of the western coastal lowlands. A total of five populations are known, several being as large and as vigorous as the one studied in detail, which had about 400 plants extending over several hectares. The populations are generally surrounded by alien *Acacia* infestations and ploughed lands. During dry periods the habitat of the population studied becomes degraded by heavy grazing. Urgency for conservation: maximum priority.
- S. candicans*: Critically Rare; shrub; September-November; 3318DB, 3319AC. Population status: known from three disjunct places up to 85 km apart. At one population a few thousand plants were seen, scattered in patches over an area of about 500 ha. Urgency for conservation: medium priority for occasional monitoring.
- S. collina* (= *S. flagellaris* R.Br.): Endangered; shrub; September-November; 3418AB/AD. Population status: previously recorded from four places in a 16 km-long, well-explored area. A population of a dozen plants have recently been found in a Divisional Council Nature Reserve. It has been re-discovered at only one of its former localities, where there is a scattered population of about 50 plants in an *Acacia*-infested area of 3 ha. The Acacias are being cleared from around the plants by two volunteer groups affiliated to Captrust, the Fish Hoek Mountain Weeders and the Simon's Town Flora Conservation Group. There is a risk of genetic decline due to the small size of the population. However, the plants have lignotubers and appear to be long-lived. The consequent slow reproductive turnover would have slowed the rate of genetic decline through the bottleneck of small numbers caused by the *Acacia* invasion. Cultivation: the plant was on a priority list for growing at the nursery of Provincial Nature Conservation but this programme has been transferred to Kirstenbosch. The sites lie in the Peninsula Nature Area. Further study: further careful searches should be made at other former sites. Urgency for conservation: maximum priority.
- S. confragosa*: Critically Rare; shrub; October-December; 3219CC, 3319AA
- S. decumbens*: (= *S. hyemalis* Salisb. ex J. Knight); Critically Rare; shrub; July-November; 3418AB
- S. flava*: Critically Rare; shrub; September-December; 3219AC. Population status: known from a scattered population lying in an area 3 km in length. Only a few hundred plants could be found after careful searching. Future monitoring should take note of the possibility of ploughing on the upland plain where the plants occur. Urgency for conservation: medium priority for occasional monitoring.
- S. florida*: Endangered; shrub; April, October; 3319CC, 3418BB.
- S. furcellata*: Endangered; shrub; September-November; 3318DC/DD. Population status: known from two places 6 km apart in the heavily threatened natural vegetation of the western coastal lowlands. One population had only 15 plants in 1982 and may soon become extirpated. The other population had in 1978 a vigorous population of some 150 plants in a 6 ha area, with another 150 scattered over about 14 ha among a dense alien *Acacia* infestation. In 1982 there were only 120 plants left in this population, which is expected to be totally destroyed by housing development. Other threats were trampling, squatter housing, and over-frequent or wrong-season fires. Translocation to another site, such as a Provincial Nature Reserve 15 km away,

has been proposed. Cultivation: Kirstenbosch had 76 plants in 1980, 20 in 1982; there were 410 plants in 1983 at the nursery of Provincial Nature Conservation, the collections of which were transferred to Kirstenbosch in 1985. Seeds are being stored in the Bolus Herbarium seed-bank. Urgency for conservation: maximum priority: this is one of the most critical cases in the region.

- S. hirsuta:** Critically Rare; shrub; May-October; 3418AB
- S. inconspicua:** Critically Rare; shrub; July-December; 3418AB/BD, 3419AA/AC
- S. incrassata:** Indeterminate; shrub; August-September; 3318BA/DA/DB/DC/DD. Population status: known from three places in a 20 km-long area in the heavily threatened natural vegetation of the western coastal lowlands. At one population there were several thousand plants in a good-quality fynbos relict of a few hectares, surrounded by ploughed lands. Further study: populations at the other places should be surveyed. Urgency for conservation: high priority for creating a nature reserve at the site surveyed, for this and other threatened plants.
- S. leipoldtii:** Critically Rare; shrub; October-December; 3219AA
- S. linearis:** Vulnerable; shrub; October-November; 3318BC/CB?/DA. Population status: known from a 40 km-long area in the heavily threatened natural vegetation of the western coastal lowlands. Careful searching has revealed one surviving population of several hundred plants in about 50 ha, infested by alien Acacias. The population is included in an area which has been purchased by Provincial Nature Conservation for a reserve for this and over 30 other threatened plants. Urgency for conservation: high priority.
- S. meisneriana:** Critically Rare; shrub; June-September; 3419AA/AC/AD
- S. pinnata:** Vulnerable; shrub; July-October; 3318DC/DD
- S. roxburghii:** Endangered; shrub; November; 3318BD/DA/DB. Population status: known from three places in a 30 km-long area in the heavily threatened natural vegetation of the western coastal lowlands. At one place there are two populations with 3 000 and less than 100 plants respectively, in a total of 24 ha; at another there is a small population in an area of 200 ha; and at another the plants were dying, probably due to a lowering of the water-table caused by a dense infestation of alien Acacia. There is a severe risk of the largest population being destroyed by ploughing; over-frequent or wrong-season fires are also a threat to the plants. Cultivation: Kirstenbosch had 12 plants in 1982 from cuttings taken in the wild. Urgency for conservation: maximum priority.
- S. trilopha:** Endangered; shrub; September-November; 3318CB/CD/DA/DB/DC, 3418BA. Population status: known from four places in a 35 km-long area in the heavily threatened natural vegetation of the western coastal lowlands. At one place there were 40 plants in a 3 ha area under pressure from trampling by sheep; alien *Acacia* infestations; and which is to be covered by a township; at another there was a population of a few plants; at another there were a few hundred plants, and less at another site. Cultivation: once grown at Kirstenbosch but all four plants died. Urgency for conservation: maximum priority.
- S. triternata:** Critically Rare; shrub; September-December; 3319AA. Population status: known from three places in a 25 km-long mountainous area. At one population there were about 400 plants in a 1 ha area. Two others each had a few hundred plants. Future monitoring should take note of the possibility of Pines spreading from a nearby plantation. Urgency for conservation: low priority: 5-yearly monitoring.
- S. williamsii:** Critically Rare; shrub; May; 3319DC
- S. zeyheri:** Critically Rare; shrub; October-November; 3319CC
- Sineoperculum rourkei (Mesembryanthemaceae):** Uncertain; annual herb; August-September; 3018CA, 3118AB
- Solanum crassifolium (Solanaceae):** Indeterminate; shrubby herb; 3418BB
- Sonderothamnus petraeus (Penaeaceae):** Critically Rare; shrublet; September-January; 3418BD, 3419AC

- S. speciosus*: Critically Rare; shrub; August-October; 3419AC
- Sorocephalus alopecurus* (Proteaceae): Critically Rare; shrub; September-November; 3319CD, 3419AB
- S. crassifolius*: Vulnerable; shrublet; December-February; 3419BA
- S. imbricatus*: Endangered; shrub; September-December; 3218DA/DB/DC/DD, 3319AA/AC. Threats: over-frequent fires, genetic decline due to small population-size. One population in a well-studied area was reduced to two plants in 1983. Urgency for conservation: high priority.
- S. palustris*: Endangered; shrublet; December-February; 3418BB. Restricted to a single population at high altitude, which may be sensitive to a wrong-season, intensive fire. Urgency for conservation: high priority.
- S. pinifolius*: Critically Rare; shrub; June-October; 3419BB
- S. scabridus*: Vulnerable; shrub; October-November; 3219CC, 3319AA
- S. tenuifolius*: Extinct; shrublet; January-February; 3418BB. Population status: formerly existed in a single population extending over 2 ha which the landowner intended to set aside as a nature reserve. In 1980 there were 700 plants; all but 15 of these were destroyed in a fire the next year. By 1982 there appeared to have been good seedling regeneration with many hundreds of plants. The surroundings were then ploughed for apple orchards and a windbreak of Pines was planted through the population. The habitat was finally destroyed by ploughing in 1985. Cultivation: 7 plants in the nursery of Provincial Nature Conservation were transferred to Kirstenbosch in 1985. The plant is of scientific interest and would be decorative in horticulture. Urgency for conservation: maximum priority.
- S. teretifolius*: Critically Rare; shrublet; November-December; 3319CC
- Sparaxis elegans* (Iridaceae): Critically Rare; geophyte; September; 3119AC. Population status: known from Namaqualand, restricted to a 19 km-long area in several parts of which it is locally common. The plant appears to be stimulated by grazing and the plant was even appearing in land that had been ploughed. Reserves had been fenced off on one farm to help conserve the plant. Cultivation: this attractive plant would be a valuable subject for horticulture. Urgency for conservation: low priority: action is already well in hand.
- S. fragrans*: Indeterminate; geophyte; September; 3419AA/AB/BA
- S. pillansii*: Indeterminate; geophyte; September; 3119AC
- S. tricolor*: Indeterminate; geophyte; September; 3119AC
- Spatalla argentea* (Proteaceae): Critically Rare; shrub; October-January; 3319DC
- S. colorata*: Critically Rare; shrub; July-November; 3318DC, 3320DC/DD, 3419AB
- S. ericoides*: Vulnerable; shrub; August-October; 3419BC/DA/DB
- S. nubicola*: Critically Rare; shrub; September-December; 3320DD. Population status: known from two high-altitude populations in a 5 km-long area. At one population it occurs as several hundred plants scattered along a ridge for a few hundred metres, in a Wilderness Area. Cultivation: although very attractive, the plant may be too habitat-specific for use in horticulture. Urgency for conservation: low priority: occasional monitoring.
- S. prolifera*: Endangered; shrublet; September-December; 3418BB/BD, 3419AA/AC. Population status: formerly known from places in a 30 km-long area. Two of the places were valley-bottom marshes which have been submerged under the stored water of large dams. The status of a third population is in question, being in an area of extensive bush-clearing next to a weapons-testing installation. The fourth site has two populations, one of which is confined to a single patch of marsh of about 120 m² in area, carrying about 400 young plants which are the result of post-burn regeneration. The other population is smaller than this. Both would be flooded if a proposed large storage dam were built at this site. Disease resistance in the larger population may be at risk due to possible genetic decline in the small number of plants: about 5% had died probably due to fungal infection. Urgency for conservation: maximum priority.

- S. propinqua*: Indeterminate; shrub; June-March; 3319CC, 3419AA/BB
- S. salsoloides*: Critically Rare; shrub; October-December; 3319CC/CD
- S. tulbaghensis*: Endangered; shrub; September-December; 3319AB
- Sphalmanthus arenicolus* (*Mesembryanthemaceae*): Uncertain; succulent; September-October; 3017AD
- Spiloxene declinata* (*Hypoxidaceae*): Indeterminate; geophyte; April; 3419DA
- S. maximiliani*: Uncertain; geophyte; July-September; 3218BD
- S. minuta*: Indeterminate; geophyte; April-June; 3219AA, 3318CD/DD
- S. umbraticola*: Uncertain; geophyte; July-October; 3219CA
- Staavia dodii* (*Bruniaceae*): Critically Rare; shrub; January-August; 3418AD. Population status: known from 7 populations in a 6 km-long area in a Divisional Council Nature Reserve. In 1982 the numbers of plants in the populations were: 300, 230, 135, 62, 25, 23, and 15 individuals. The chief threat is an accidental fire too soon after a planned burn, as the plant must get up to a certain size before it can start replenishing the seed-store in the soil. Alien *Acacia* infestations have been cleared. Any *Acacia* seedlings appearing in the population are removed. Cultivation: the plant has high potential for horticulture: young plants are being grown at Kirstenbosch from cuttings. Urgency for conservation: high priority.
- S. dregeana*: Indeterminate; shrub; June-February; 3418AB
- S. glutinosa*: Critically Rare; shrub; April-September; 3318AB/CD, 3325CC, 3418AB. Population status: known from two places in a 15 km-long area on the Cape Peninsula, with a remarkable disjunct reported 650 km to the east. One population had a few hundred individuals in a 200 m² area. Urgency for conservation: low priority, for monitoring.
- S. phylloides*: Indeterminate; shrub; September; 3119AC
- S. trichotoma*: Extinct; shrub; 3419BA/BB
- S. zeyheri*: Endangered; shrub; July-October; 3419BB. Threats: Pine trees and dense *Protea* stands.
- Staberoha multispicula* (*Restionaceae*): Indeterminate; April-August; 3419DA/DB/DD
- S. stokoei*: Critically Rare; tussock herb; December; 3322AC/BC
- Stapelia barklyi* (*Asclepiadaceae*): Indeterminate; succulent; 2917DB
- S. bijliae*: Uncertain; succulent; 3422AA
- S. concinna* var *concinna*: Endangered; succulent; 3329DA
- S. concinna* var *paniculata*: Critically Rare; succulent; April-June; 3119AC/BD, 3319CB
- S. conformis*: Critically Rare; succulent; March-July; 3325AC
- S. cyclista*: Critically Rare; succulent; December; 3118DC
- S. divaricata*: Vulnerable; succulent; March-May; 3225BB, 3419AD, 3420BA
- S. dwequensis*: Endangered; succulent; 2919AB, 3320AA
- S. erectiflora*: Critically Rare; succulent; March-June; 3119CD, 3218BB, 3219AB
- S. gariensis*: Uncertain; succulent; August-April; 2816BD/DA
- S. glanduliflora*: Vulnerable; succulent; June-August; 3118BD/DC, 3218BB/BD, 3319AD

- S. immelmaniae*: Vulnerable; succulent; October, March; 3218DA/DC
- S. longii*: Indeterminate; succulent; 3119AC, 3220AA, 3325AC
- S. macowanii*: Uncertain; succulent; June; 2821BC, 3224DD
- S. neliana*: Indeterminate; succulent; 2816BD, 2817AC/DD
- S. nouhuysii*: Vulnerable; succulent; August; 3119CD, 3218AB/BB
- S. parvipuncta* var *truncata*: Uncertain; succulent; June-September; 3219AC/AB/CD, 3320AA
- S. plantii*: Critically Rare; succulent; 3325CD, 3326BC
- S. rubiginosa*: Critically Rare; succulent; February; 2816BD, 2817CD
- S. thudichumii*: Critically Rare; succulent; November; 3119DB, 3219CD/DD, 3220DA
- S. umbonata*: Critically Rare; succulent; 2816BB, 2817AC
- S. vetula* var *simsii*: Uncertain; succulent; 3319BC
- S. villetae*: Indeterminate; succulent; April; 3119BC/BD
- S. virescens*: Uncertain; succulent; February-June; 2922DA, 2923DB
- Stapelianthus baylissii* (Asclepiadaceae): Indeterminate; succulent; 3324AD
- S. choananthus*: Indeterminate; succulent; December; 3321DA
- Stapeliopsis neronis* (Asclepiadaceae): Endangered; succulent; 2816BD, 2917AA
- S. saxatilis* var *stayneri*: Critically Rare; succulent; January; 3420BC/BD
- Steirodiscus speciosus* (Asteraceae): (= *Psilothonna speciosa*); Vulnerable; annual herb; September-October; 3318AD/CB
- Stilpnophytum inopinatum* (Asteraceae): Uncertain; shrub; September; 3320CD/DC
- S. oocephalum*: Uncertain; shrub; September; 3322CD, 3420AA
- Stoebe copholepis* (Asteraceae): Uncertain; shrub; February-March; 3419BD/DA/DB
- S. cyathuloides*: Uncertain; shrub; December; 3419DB, 3420BC
- S. ensori*: Uncertain; shrub; January-July; 3322DC, 3324CD
- S. gomphrenoides*: Vulnerable; shrub; October-November; 3318BC/DA, 3418BA. Population status: previously known from a 50 km-long area in the heavily threatened natural vegetation of the western coastal lowlands. After extirpated by urbanization and other pressures, the plant is now confined to an 8 km-long area. Currently known from four populations totalling several thousand plants: the largest consists of over a thousand individuals scattered through about 750 ha. This site is included in an area which has been purchased by Provincial Nature Conservation for a reserve for this and over 30 other threatened plants. All the populations are threatened by alien *Acacia* infestations. Urgency for conservation: high priority.
- S. humilis*: Critically Rare; shrub; January-February; 3418BD, 3419BC
- S. muirii*: Indeterminate; shrub; March-April; 3420AD, 3421AD. Population status: known from two disjunct places 100 km apart. At one there are a few hundred plants scattered along a ridge, threatened by alien *Acacia* infestations and by housing development. At the other place small dispersed colonies were found in a Provincial Nature Reserve. Further exploration is needed. Urgency for conservation: medium priority.

- S. salteri*: Vulnerable; shrub; December-January; 3419AD/DA/DB/DD, 3421DD
- Stomatium geoffreyi* (Mesembryanthemaceae): Endangered; succulent; October; 3325BA
- S. ronaldii*: Endangered; succulent; November-December; 3225BA
- Strelitzia alba* (Strelitziaceae): Indeterminate; tree; July-December; 3323DC, 3423AB/BB
- Strumaria picta* (Amaryllidaceae): Uncertain; geophyte; May; 3119AC/CA
- S. salteri*: Uncertain; geophyte; April-May; 3118BD/DB, 3119AC, 3219AA
- S. pubescens*: Critically Rare; geophyte; 3320BA
- S. watermeyeri*: Uncertain; geophyte; April-May; 3119AC
- Stylapterus barbatus* (Penaeaceae): Critically Rare; shrublet; October-November; 3418BB
- S. candolleanus*: Uncertain; shrublet; without precise locality
- S. dubius*: Critically Rare; shrublet; May, September; 3320CD; 3321CD
- S. ericifolius*: Critically Rare; shrub; September-October; 3320CD
- S. ericoides* ssp *ericoides*: Vulnerable; shrub; September-October; 3319AC. Population status: known from only one population of about 200 plants along a 200 m stretch of stream-bank in a well-explored mountain area. The population could be lost if there were a series of over-frequent or wrong-season fires. Invasive *Hakea* and Pine occur in the vicinity. Urgency for conservation: medium priority.
- S. ericoides* ssp *pallidus*: Critically Rare; shrub; September; 3319CA
- S. micranthus*: Endangered; shrub; September; 3418BB; 3419AA
- S. sulcatus*: Critically Rare; shrublet; September-May; 3319CA/CC
- Sutera atrocaerulea* (Scrophulariaceae): Uncertain; shrub; July,December; 3324CB/CC
- S. cephalotes*: Uncertain; shrub; 3419AB/AC/AD; 3420AB
- S. cephalotes* var *glabrata*: Uncertain; shrub; 3419AD
- S. divaricata*: Uncertain; shrub; 3119BC/BD
- S. esculenta*: Vulnerable; shrub; May-September; 3119BD; 3120CA
- S. gracilis*: Uncertain; shrub; 3119BC/BD
- S. infundibiliformis*: Uncertain; shrub; April, September; 3325CD; 3420CA
- S. intertexta*: Uncertain; shrub; 3325DD
- S. stenopetala*: Uncertain; herb; 3119BC/BD
- S. subnuda*: Uncertain; herb; 3321CC
- Synnotia roxburghii* (Iridaceae): Indeterminate; geophyte; August-September; 3218BD
- Syringodea derustensis* (Iridaceae): Critically Rare; geophyte; May-June; 3322BC
- S. flanagani*: Uncertain; geophyte; April-June; 3325DC
- S. pulchella*: Uncertain; geophyte; March-April; 3124CB/DC, 3225DA
- S. saxatilis*: Uncertain; geophyte; May-June; 3321AD

- Tanquana hilmari* (Mesembryanthemaceae): Endangered; succulent; April-May; 3320BA/BB/BD, 3321AC/AD
- Tenicroa nana* (Hyacinthaceae / Liliaceae): Uncertain; geophyte; November; 3018AC
- Tetraria brachyphylla* (Cyperaceae): Uncertain; tufted perennial; 3318DD, 3418AB
- T. compacta*: Uncertain; tufted perennial; August-November; 3318CD, 3419AA
- T. paludosa*: Indeterminate; tufted perennial; August-November; 3318CD, 3418AB
- T. robusta*: Uncertain; tufted perennial; March; 3320DD, 3324CD
- Thaminophyllum latifolium* (Asteraceae): Critically Rare; shrub; August-December; 3419AC/AD
- T. multiflorum*: Uncertain; shrub; September-January; 3418BB, 3419AA/AB/AD
- T. mundii*: Critically Rare; shrub; July-November; 3419AA/AB/AC
- Thamnea depressa* (Bruniaceae): Extinct; shrub; January-February; 3319AD, 3419BA
- T. gracilis*: Indeterminate; shrub; January; 3320CD
- T. hirtella*: Vulnerable; shrub; February-April; 3329AA
- T. uniflora*: Extinct; shrub; January-March; 3319CC, 3418BB
- Thamnochortus acuminatus* (Restionaceae): Critically Rare; tufted herb; January; 3319CB
- T. dumosus*: Vulnerable; tufted herb; April-September; 3419AA/AC/DA/DB. Threats: alien vegetation.
- T. ellipticus*: Indeterminate; tufted herb; June; 3321CC
- T. fraternus*: Critically Rare; tufted herb; June; 3321CC
- T. guthrieae*: Critically Rare; tufted herb; May-July; 3419AB/DB
- T. muirii*: Vulnerable; tufted herb; July-October; 3322CD, 3420CA, 3421AD/BA, 3422AA
- T. nutans*: Critically Rare; tufted herb; October-March; 3318CD, 3418AB. Population status: known from two mountain areas 10 km apart. One population has many thousand plants in an area 2,7 km long. The only localized threat that may need to be monitored is trampling and widening of footpaths. Urgency for conservation: low priority, for monitoring.
- T. pellucidus*: Vulnerable; tufted herb; 3418BD, 3419BD/DA/DB/DD
- T. pluristachyus*: Vulnerable; tufted perennial; 3320CD, 3419DB/DD, 3420AD/CA
- Thereianthus racemosus* (Iridaceae): Critically Rare; geophyte; December; 3218DB, 3219CC, 3319AA
- Thesium bathyschistum* (Santalaceae): Uncertain; shrub; November-December; 3418BD
- T. fallax*: Uncertain; shrub; December; 3419BD/DB
- T. litoreum*: Critically Rare; shrub; January; 3318CB
- Trachyandra adamsonii* (Asphodelaceae / Liliaceae): Uncertain; shrub; August; 3118DC
- T. gracilentata*: Uncertain; tussock herb; September; 3119CA
- Trianoptiles solitaria* (Cyperaceae): Indeterminate; tussock herb; August-October; 3318CD/DC
- T. stipitata*: Indeterminate; tussock herb; August-October; 3318DC, 3418BB

- Trichocaulon alstoni** (Asclepiadaceae): Indeterminate; succulent; October, January; 2816BB, 2917BA, 2919AB
- T. annulatum**: Critically Rare; succulent; June; 3223CC, 3224DC, 3323AD
- T. cinereum**: Critically Rare; succulent; October-March; 2816B, 2817A/DC
- T. grande**: Uncertain; succulent; October-November; 3320BD
- T. halenbergense**: Uncertain; succulent; January; 2816BB
- T. keetmanshoopense**: Indeterminate; succulent; April-June; 2820DC
- T. kubusense**: Indeterminate; succulent; 2816BB/BD
- T. pictum**: Indeterminate; succulent; 2919AA
- T. pillansii**: Endangered; succulent; July-November; 3022AB, 3218CD, 3320BC
- T. rusticum**: Uncertain; succulent; 2921AC
- T. simile**: Uncertain; succulent; 2820DC, 2917AA, 2922AC/DA, 3118DA
- T. truncatum**: Critically Rare; succulent; March; 2917BB
- Trichodiadema aurea** (Mesembryanthemaceae): Indeterminate; succulent shrub; September; 3323BD
- T. burgeri**: Critically Rare; succulent shrub; September; 3322BC
- T. densum**: Critically Rare; shrub; June-November; 3320BA, 3323AC/CA
- T. hallii**: Critically Rare; shrub; December; 3321AD/BC
- T. obliquum**: Indeterminate; shrub; February; 3223AA
- T. peersii**: Indeterminate; shrub; April-May; 3323AD
- T. pygmaeum**: Indeterminate; shrub; May-June; 3420BD
- T. rogersiae**: Indeterminate; shrub; April-March; 3225BA/BB
- T. rupicolum**: Indeterminate; shrub; October, February; 3325DC
- Tridentia baylissi** (Asclepiadiaceae): Indeterminate; succulent; 3324AD
- T. choananthus**: Indeterminate; succulent; 3321DA
- T. longii**: Indeterminate; succulent; 3325AC
- T. parvipuncta**: Indeterminate; succulent; 3219DD, 3320AA
- T. virescens**: Uncertain; succulent; February-June; 2922DA, 3023DB
- Tritonia kamisbergensis** (Iridaceae): Uncertain; geophyte; December; 2917BC
- Tritoniopsis elongata** (Iridaceae): Indeterminate; geophyte; March-April; 3318DB/DD; 3319CA, 3419BA.
Seeds of this plant are being stored in the Bolus Herbarium seed-bank.
- T. flexuosa**: Vulnerable; geophyte; January-February; 3419AD
- T. latifolia**: Critically Rare; geophyte; December-January; 3219AA
- Tylecodon cacalioides** (Crassulaceae): Vulnerable; succulent; January; 3321CA/CB, 3322CA/CB, 3421AB

- T. fragilis*: Critically Rare; succulent; February; 3118CA
- T. pearsonii*: Critically Rare; succulent; 2816BB/BD
- T. rubrovenosus*: Critically Rare; succulent; 2817DA/DC, 2818DC/DD, 2819CC
- T. schaeferianus*: Uncertain; succulent; February; 2816DC
- T. striatus*: Critically Rare; succulent; 3119CD
- Urginea duthieae* (Hyacinthaceae / Liliaceae): Indeterminate; geophyte; October-November; 3318CD/DD
- U. ecklonii*: Extinct; geophyte; December; 3318CD
- U. forsteri*: Uncertain; geophyte; 3318AB/AD; 3319CB
- U. minor*: Indeterminate; geophyte; February-April; 3318DD
- U. pygmaea*: Indeterminate; geophyte; March-April; 3318CD/DD
- U. revoluta*: Uncertain; geophyte; January-March; 3318DD, 3418BB
- Ursinia coronopifolia* (Asteraceae): Critically Rare; shrublet; January-April; 3319AA
- U. chrysanthemoides* var *geyeri*: Critically Rare; perennial herb; June-August; 3219DA
- U. subflosculosa*: Critically Rare; shrublet; November-December; 3118DA/DC, 3219AC
- U. pygmaea*: Uncertain; annual herb; July-October; 3018; 3118AB/CA/DA
- Venidium angustifolium* (Asteraceae): Uncertain; perennial herb; April, October-November; 3319AC/AD/CA/CB, 3419DB
- V. bolusii*: Uncertain; perennial herb; January-April; 3223CA, 3225DB
- V. fugax*: Uncertain; annual herb; October; 3120
- V. macrospermum*: Uncertain; perennial herb; January; 3319AD/CC
- Vexatorella latebrosa* (Proteaceae): Critically Rare; shrub; August-September; a few populations are known in an area of a few square kilometres; 3320CC
- Wahlenbergia annuliformis* (Campanulaceae): Indeterminate; herb; October; 3318AB/DA
- W. asperifolia*: Uncertain; herb; September; 3118DC
- W. bolusiana*: Uncertain; herb; December; 3419DA
- W. bowkeri*: Uncertain; herb; 3225D
- W. brachycarpa*: Indeterminate; annual herb; September-November; 3118, 3218BB/BD, 3219AA/AC, 3322BA
- W. busseriana*: Critically Rare; herb; September; 3018CC
- W. ciliolata*: Uncertain; herb; October-November; 3318CD/DB, 3422AA
- W. clavatula*: Uncertain; herb; 3318CD
- W. compacta*: Uncertain; herb; November; 3318AB

W. constricta: Uncertain; herb; September; 3218BD
W. debilis: Indeterminate; annual herb; September; 3318
W. distincta: Uncertain; herb; September; 3218BB
W. divergens: Uncertain; annual herb; November; 3118CA
W. dunantii: Uncertain; herb; October; 3318CD
W. floribunda: Uncertain; herb; September; 2917DD
W. lasiocarpa: Uncertain; herb; September; 3017BD
W. longisepala: Uncertain; herb; September; 3118DA/DC
W. massonii: Uncertain; annual herb; September; 3218DA, 3318DC
W. minuta: Uncertain; herb; 3119BC
W. mollis: Uncertain; herb; November; 3319CA
W. namaquana: Uncertain; herb; 3018CD
W. oligotricha: Uncertain; herb; September; 2917DA
W. perennis: Uncertain; herb; 3224AA
W. polyclada: Uncertain; herb; November; 3118CA
W. ramifera: Uncertain; herb; locality unknown
W. rara: Uncertain; herb; September; 3018CA
W. roelliflora: Uncertain; herb; September; 2917DD
W. rotundifolia: Uncertain; herb; December; 3318CD
W. saxifragoides: Uncertain; herb; February; 3318CD
W. schistacea: Uncertain; herb; November-December; 3319CA
W. serpentina: Uncertain; herb; November; 3318AB, 3419B
W. subpilosa: Uncertain; herb; December; 3318DC
W. subtilis: Uncertain; herb; March; 3218DB
W. swellendamensis: Uncertain; herb; 3319DD
W. tomentosula: Uncertain; herb; September-October; 3218DC, 3319AA
W. tumida: Uncertain; herb; November; 3320AC, 3421AD
Watsonia ardernei (Iridaceae): Uncertain; geophyte; September-October; 3319AC
W. caledonica: Uncertain; geophyte; September; 3419AA/AB/BB/DB, 3420AA/CC
W. cooperi: Uncertain; geophyte; September-November; 3219CA, 3319CB
W. dubia: Uncertain; geophyte; September-November; 3318BC, 3319AA/AC
W. ecklonii: Critically Rare; geophyte; January; 3323DC, 3324CA/CB/DA

- W. emiliae*: Uncertain; geophyte; November-December; 3321CC, 3322AD
- W. hysterantha*: Indeterminate; geophyte; May-June; 3317BB, 3318AA
- W. pauciflora*: Uncertain; geophyte; October-November; 3419AA
- W. rogersii*: Uncertain; geophyte; September-November; 3418BB
- W. rosea-alba*: Indeterminate; geophyte; September-November; 3318DA/DC, 3319CC, 3418BB.
- W. stanfordiae*: Indeterminate; geophyte; October-November; 3318DD, 3319CC
- W. strictiflora*: Uncertain; geophyte; October-November; 3318DB/DD, 3418BB
- W. vittata*: Uncertain; geophyte; November-December; 3318CD
- W. wordsworthiana*: Uncertain; geophyte; September-October; 3318DC, 3319AC
- Widdringtonia cedarbergensis* (Cupressaceae): Vulnerable; tree; 3219AA/AC
- W. schwarzii*: Vulnerable; tree; 3323BC/BD/CB/DA/DB
- Willdenowia affinis* (Restionaceae): Uncertain; tussock herb; May; 3318CD
- W. purpurea*: Critically Rare; tussock herb; December; 3319CC, 3419AA
- Witsenia maura* (Iridaceae): Critically Rare; shrub; January-August; 3418AB/AD/BB/BD, 3419AA/AC.
 Population status: known from 12 places in a 90 km-long area. In each population the aerial shoots stand close together, making it very difficult to see how many are connected by underground rhizomes. The populations vary from a few square meters to almost 2 ha, isolated and only present in a few of the marshes in any area. One population at Hermanus is being extirpated by housing construction. Cultivation: research should be directed on how to grow this fine plant which would be an outstanding subject as a wetland ornamental, with bright yellow and nearly black flowers. Urgency for conservation: medium priority.
- Zeuktophyllum suppositum* (Mesembryanthemaceae): Uncertain; shrublet; January; 3321CC
- Zaluzianskya nemesioides* (Scrophulariaceae): Uncertain; herb; 3119BC/BD
- Z. ramosa*: Indeterminate; annual herb; June; 3418AB

APPENDIX 2: THREATENED PLANTS IN BIO-GEOGRAPHICAL ZONES

The following lists give the estimated occurrences of species in bio-geographical zones in each of the five regions covered by this report. The zones were delineated using mapped vegetation data for the fynbos and the karoo biomes (Moll et al. 1984, Boucher 1983; C. Hilton-Taylor, in prep.). For the same reasons noted in Appendix 1, the distribution data given below are essentially preliminary.

Maps and summary statistics for each of the zones are given in Appendix 3. The zones can be located on the maps by means of the code-letters given in the headings below. The threatened-status categories are defined in the Introduction to this report and are abbreviated as follows:

- X: Extinct
- E: Endangered
- V: Vulnerable
- R: Critically Rare
- I: Indeterminate
- U: Uncertain

WESTERN COASTAL LOWLAND REGION

Peninsula Mountains: Map 1 — PM

- | | |
|---------------------------------|--|
| Acrolophia bolusii — V | E. eburnea — R |
| A. ustulata — E | E. fairii — E |
| Agathosma corymbosa — E | E. fontana — R |
| Aspalathus borbonifolia — R | E. heleogena — E |
| A. capitata — U | E. limosa — E |
| A. macrantha — I | E. marifolia — R |
| Athanasia capitata — I | E. paludicola — V |
| Audouinia capitata — V | E. patersoniae — R |
| | E. pilulifera — E |
| Bobartia gladiata ssp major — R | E. quadrisulcata — R |
| Brachystelma occidentale — I | E. sociorum — E |
| Bulbine minima — U | E. urna-viridis — R |
| | Eriospermum stoloniferum — U |
| Cliffortia carinata — U | |
| C. cymbifolia — U | Ficinia micrantha — I |
| C. intermedia — U | |
| Corycium bifidum — I | Galaxia alata — V |
| C. excisum — R | Gerbera wrightii — R |
| C. rubiginosum — U | Gladiolus aureus — E |
| Cotula myriophylloides — E | G. jonquilliodorus — E |
| Cyphia dentariaefolia — U | G. ornatus — R |
| | G. pillansii var roseus — R |
| Disa bodkini — R | G. vigilans — R |
| D. ocellata — R | |
| D. salteri — R | Harveya squamosa — R |
| D. tenuis — R | Helicotrichon quinquesetum — U |
| Disperis bodkini — R | Heliophila cinerea — R |
| Drimia minor — R | H. tabularis — R |
| | Hermannia micrantha — I |
| Elegia fenestrata — V | H. rudis — I |
| E. prominens — V | Herschelianthe forficaria — R |
| E. verreauxii — V | Holothrix mundii — U |
| Erica amoena — R | Homoglossum merianellum var aureum — R |
| E. annectans — R | H. merianellum var merianellum — R |
| E. blancheana — R | Hypodiscus paludosus — V |
| E. capensis — R | |
| E. clavisepala — R | Ischyrolepis coactilis — V |
| E. cyrillaeflora — V | |

- Klattia partita* — R
Kobresia ecklonii — U

Lachnaea eriocephala — R
Leucadendron argenteum — V
L. floridum — E
L. macowani — E

Macrostylis villosa ssp *villosa* — I
Mimetes hirtus — V
Monadenia ecalcarata — R
M. macrostachya — E
M. physodes — I
M. pygmaea — U
M. sabulosa — R
Moraea aristata — E
M. elsiae — R
Muraltia comptonii — R

Nemesia micrantha — E

Pachites bodkini — V
Pelargonium elaphiae — E
Phylla schlechteri — I
Polycarena capitata — I
Priestleya glauca — I
P. laevigata — U
P. tomentosa — R
Psoralea glaucina — I
Pterygodium connivens — V

Restio dodii var *dodii* — R
R. harveyi — V
Romulea papyracea — X
Ruschia filamentosa — I
R. promontorii — E
R. rubricaulis — I

Satyridium rostratum — R
Satyrium foliosum — V
Schizodium obliquum ssp *obliquum* — R
Scolepogena veruculata — R
Serruria collina — E
S. cyanoides — V
S. decumbens — R
S. hirsuta — R
S. inconspicua — R
S. trilopha — E
Staavia dodii — R
S. dregeana — I
S. glutinosa — R

Tetralia brachyphylla — U
T. compacta — U
T. paludosa — I
Thamnochortus fraternus — R
T. nutans — R
T. punctatus — V

Wahlenbergia ciliolata — U
W. clavatula — U
W. dunantii — U
W. rotundifolia — U
Watsonia vittata — U

Willdenowia affinis — U
Witsenia maura — R

Zaluzianskya ramosa — I

Peninsula Lowlands: Map 1 — PL

Acrolophia bolusii — V
Agathosma corymbosa — E
A. glabrata — I
Apium inundatum — I
Arctotheca forbesiana — I
Aspalathus globulosa — I
A. variegata — X
Athanasia capitata — I

Chondropetalum rectum — V
Cliffortia longifolia — U
Corycium bifidum — I
C. excisum — R
C. microglossum — V
Cotula myriophylloides — E

Diastella proteoides — V
Disa tenella ssp *tenella* — R
Disperis bodkini — R
Dorotheanthus apetalus — U
Drimia minor — R

Elegia prominens — V
E. verreauxii — V
Erica capitata — R
E. crucistigmatica — E
E. ferrea — V
E. margaritacea — E
E. paludicola — V
E. pyramidalis — X
E. turgida — X
E. verticillata — X
Eriospermum pumilum — I
Euphorbia marlothiana — E

Ficinia limosa — I

Galaxia alata — V
Geissorhiza geminata — R
Gladiolus carinatus ssp *parviflorus* — I
G. quadrangulus — E

Hermannia procumbens ssp *procumbens* — I
H. rugosa — V
Herschelianthe barbata — E
H. lugens var *lugens* — V
H. venusta — U
Holothrix mundii — U

Ischyrolepis sabulosis — E
Isolepis inconspicua — I

Lampranthus arbuthnotiae — U
L. dunensis — I
Leucadendron floridum — E
L. levisanus — E
L. macowani — E

- Macrostylis villosa* ssp *villosa* — I
Moraea aristata — E
M. elsiae — R

Oxalis natans — E

Passerina paludosa — E
Pelargonium elaphiae — I
Pentaschistis zeyheri — U
Polycarena capitata — I
Priestleya angustifolia — U
Psoralea glaucina — I

Restio micans — V
Roella goodiana — I
Ruschia rubricaulis — I

Schizodium obliquum ssp *obliquum* — R
Scirpus deliculatus — I
Selaginella pygmaea — U
Senecio foeniculoides — I
Serruria foeniculacea — I
S. trilopha — E
Spiloxene minuta — I

Thamnochortus punctatus — V
Trianoptiles solitaria — I
T. stipitata — I

Urginea duthiae — I

Wahlenbergia dunantii — U
W. saxifragoides — U

Strandveld 1: Map 1 — S1

Aloe distans — R
Athanasia tomentella — U

Cullumia floccosa — U

Echiostachys spicatus — R

Ferraria densepunctulata — U
F. divaricata ssp *aurea* — U
F. foliosa — U

Geissorhiza lewisae — I
G. gracilis var *latifolia* — I

Hermannia repetenda — U
Hessea leipoldtii — R
H. mathewsii — V
Holothrix grandiflora — U

Ixia maculata var *intermedia* — U

Juncus obliquus — U

Lachenalia purpurea-caerulea — E
Leucadendron brunioides var *flumenlupinum* — R
Leucospermum arenarium — R
Lightfootia umbellata — U

Matricaria schlechteri — U

Oxalis reclinata var *quinata* — U

Pauridia longituba — I
Prismatocarpus fastigiatus — U

Romulea saldanhensis — V
R. sinispinosensis — U

Stapelia nouhuysii — V

Tylecodon fragilis — R

Ursinia pygmaea — U

Wahlenbergia divergens — U
W. polyclada — U

Strandveld 2: Map 1 — S2

Agathosma corymbosa — E
A. glabrata — X
A. thymifolia — R
Aloe distans — R

Diosma aspalathoides — V
D. dichotoma — V
D. pedicellata — U

Echiostachys spicatus — R

Felicia elongata — V
Ferraria densepunctulata — U

Galaxia alata — V
Geissorhiza lewisae — I
Gladiolus gracilis var *latifolius* — I

Hermannia procumbens ssp *procumbens* — E
Hessea chaplinii — V
H. mathewsii — V

Ixia purpureorosea — R

Leucospermum tomentosum — V
Limonium acuminatum — V
L. capense — I

Moraea loubseri — E
Muraltia harveyana — I

Nemesia strumosa — R

Oxalis burtoniae — I
O. subsessilis — I

Pauridia longituba — I
Phyllica greyii — I
Psoralea venusta — I

Romulea saldanhensis — V
Ruschia rubricaulis — I

Watsonia hysterantha — I

Strandveld 3: Map 1 — S3

- Athanasia rugulosa — V
 Agathosma corymbosa — E
 A. glabrata — X
- Calopsis impolitus — V
 Chondropetalum acockii — E
 C. rectum — V
- Diascia heterandra — I
 Diosma dichotoma — V
- Echiostachys spicatus — R
 Elegia verreauxii — V
 Erica ferrea — V
 Euphorbia marlothiana — V
- Geissorhiza matthewsii — V
 Gladiolus carinatus ssp parviflorus — I
 G. quadrangulus — E
 Grisebachia incana — I
 G. plumosa ssp hirta — I
 G. plumosa ssp irrorata — I
- Hermannia procumbens ssp procumbens — E
- Ischyrolepis duthiae — V
 Ixia curta — V
- Leucospermum tomentosum — V
 Limonium purpuratum — I
- Moraea elsiae — R
- Relhania rotundifolia — E
- Serruria aemula — E
 S. linearis — V
 S. trilopha — R
 Steirodiscus speciosus — V
 Stoebe gomphrenoides — V
- Trianoptiles stipitata — I
 Thesium litoreum — R
- Watsonia rosea-alba — I

Strandveld 4: Map 1 — S4

- Agathosma corymbosa — E
 Arctotheca forbesiana — I
- Calopsis rigoratus var simulans — V
 Cephalophyllum anemoniflorum — I
 Chondropetalum rectum — V
 Cliffortia longifolia — U
 Corycium microglossum — R
 Cyrtanthus carneus — V
- Diosma pedicellata — U

- Elegia verreauxii — V
 Erica crucistigmatica — E
 Euphorbia marlothiana — V
- Galaxia alata — V
 Gladiolus jonquilliodorus — E
 G. quadrangulus — E
- Hypodiscus paludosus — E
- Ixia versicolor — V
- Lobostemon bolusii — E
- Oxalis natans — E
- Schizodium obliquum ssp obliquum — V
 Stoebe gomphrenoides — V
- Thamnochortus fraternus — R
- Wahlenbergia subpilosa — U
 Watsonia rogersii — U
 W. rosea-alba — I

Sand Plain Fynbos 1: Map 1 — LF1

- Agathosma corymbosa — E
 Arctotheca forbesiana — I
 Aristea lugens — V
 Athanasia capitata — I
 A. glabrata — X
- Calopsis impolitus — V
 C. rigoratus var simulans — V
 Chondropetalum acockii — E
 C. rectum — V
 Cliffortia acockii — V
- Diascia heterandra — I
 Diastella proteoides — V
 Diosma dichotoma — V
 D. pedicellata — U
 Disa hallackii — E
- Echiostachys spicatus — R
 Elegia prominens — V
 Erica acockii — X
 E. bolusiae — E
 E. ferrea — V
- Geissorhiza furva — I
 Gladiolus carinatus ssp parviflorus — I
 G. citrinus — E
 G. ornatus — R
 G. quadrangulus — E
 G. recurvus — I
 Grisebachia incana — I
- Hermannia procumbens var myrrhifolia — U
 Herschelianthe lugens var lugens — V
- Ischyrolepis duthiae — V
 I. sabulosus — E
 Ixia versicolor — V

Leucadendron cinereum — V
L. corymbosum — V
L. levisanus — E
L. verticillatum — E
Limonium purpuratum — I

Macrostylis cassiopoides ssp dregeana — R
M. villosa ssp minor — E
M. villosa ssp villosa — I
Marasmodes duemmeri — I

Oxalis natans — E

Pelargonium ellaphieae — E
Priestleya glauca — I
Protea mucronifolia — R
P. odorata — E
Psoralea glaucina — I

Restio acockii — E

Schizodium obliquum ssp obliquum — R
Senecio foeniculoides — I
Serruria aemula — E
S. brownii — R
S. furcellata — E
S. incrassata — V
S. pinnata — V
S. roxburghii — E
S. trilopha — R
Spatalla colorata — R

Tetralix brachyphylla — U
Trianoptiles solitaria — I
T. stipitata — I

Wahlenbergia massonii — U

Sand Plain Fynbos 2: Map 1 — LF2

Acrolophia bolusii — V
Agathosma corymbosa — E
A. glabrata — X
A. glandulosa — V
A. thymifolia — R
Aspalathus acanthophylla — U
Athanasia rugulosa — V

Babiana leipoldtii — I

Calopsis impolitus — V
C. rigoratus var simulans — V
Chondropetalum acockii — E
C. rectum — V
Cliffortia acockii — V
Corycium excisum — R
C. microglossum — R
Cotula duckittiae — I

Diastella proteoides — V
Diosma aspalathoides — V
D. pedicellata — U

Elegia prominens — V
E. verreauxii — V
Erica crucistigmatica — E
E. ferrea — V
Euphorbia marlothiana — R

Galenia fruticosa var prostata — U
Geissorhiza matthewsii var matthewsii — V
Gladiolus carinatus ssp parviflorus — I
G. matthewsii var eury stigma — V
Gethyllis ciliaris — V
Grisebachia incana — I
G. plumosa ssp hirta — I
G. plumosa ssp irrorata — I

Hermannia procumbens ssp myrrhifolia — U
H. procumbens ssp procumbens — E
H. rugosa — V
Herschelianthe barbata — E

Ischyrolepis duthiae — V
Ixia framesii — E

Lachenalia purpureo-caerulea — E
Lessertia globosa — I
Leucadendron cinereum — V
L. corymbosum — V
L. levisanus — E
L. thymifolium — E
Leucospermum tomentosum — V
L. parile — V

Macrostylis cassiopoides ssp dregeana — R
M. villosa ssp villosa — I
Marasmodes oligocephalus — U
Moraea elsiae — R

Nemesia strumosa — R

Oxalis levis — V

Polycarena capitata — I
Prionanthium pholiuroides — E
Protea mucronifolia — R
P. odorata — E

Restio acockii — E
R. micans — E

Saphesia flaccida — E
Serruria aemula — E
S. brownii — R
S. linearis — V
S. trilopha — R
Steirodiscus speciosus — V
Stoebe gomphrenoides — V

Watsonia rosea-alba — I

Sand Plain Fynbos 3: Map 1 — LF3

Agathosma glabrata — X
A. glandulosa — V

A. thymifolia — R
Aspalathus acanthophylla — I
Athanasia rugulosa — V

Babiana obliqua — U

Cadiscus aquaticus — E
Calopsis impolitus — V
Cyphia dentariaefolia — U

Diosma aspalathoides — V
D. dichotoma — V

Echiostachys spicatus — R

Felicia annectens — X

Geissorhiza lewisae — I

Ixia purpureorosea — R

Leucadendron cinereum — V
L. tomentosum — R
Leucospermum tomentosum — V
Limonium capense — I

Marasmodes oligocephalus — U
Massonia nervosa — I
Muraltia harveyana — I

Nemesia strumosa — R

Polycarena sordidum — U

Relhania rotundifolia — E
Romulea aquatica — V

Urginea forsteri — U

Wahlenbergia annuliformis — I
W. compacta — U
W. serpentina — U

Sand Plain Fynbos 4: Map 1 — LF4

Hermannia procumbens ssp *myrrhifolia* — U

Leucadendron brunioides var *flumenlupinum* — R

Mosaic of Sand Plain Fynbos and Western Strandveld: Map 1 — LF/S

Arctotis aenea — U

Cyphia dentariaefolia — U

Diosma pedicellata — U
Dorotheanthus apetalus — U

Freylinia visserae — U

Limonium purpuratum — I

Coastal Renosterveld 1: Map 1 — R1

Acnadenia macradenia — R
Agathosma corymbosa — E
A. glandulosa — V
A. orbicularis — X
Aristea lugens — V
Athanasia capitata — I
A. spathulata — U

Babiana leipoldtii — I

Cadiscus aquaticus — E
Calopsis rigoratus var *simulans* — V
Cephalophyllum anemoniflorum — I
Chondropetalum acockii — E
C. rectum — V
Cliffortia acockii — V
Conophytum turrigerum — I
Corymbium salteri — I
Cotula duckittiae — I
C. paradoxa — U

Diastella beukii — E
D. proteoides — V
Diosma pedicellata — U
Drimia minor — R

Echiostachys spicatus — R
Elegia prominens — V
Erica bolusiae — E
E. clavisepala — R
E. sacciflora — R
E. trichophora — U
Euchaetis schlechteri — R

Felicia annectens — X

Galaxia alata — V
Geissorhiza burchellii — U
G. lewisae — I
G. furva — I
G. pappei — U
Gladiolus blommesteinii — I
G. citrinus — E
G. jonquilliodorus — E
G. martleyi — U
G. nerineoides — U
G. recurvus — I
Grisebachia incana — I
G. plumosa ssp *irrorata* — I

Haemanthus pumilio — E
Hermannia procumbens var *myrrhifolia* — U
H. rugosa — V

Ischyrolepis duthiae — V
Isoetes capensis var *stephansenii* — I
Isolepis inconspicua — I
Ixia maculata var *maculata* — V
I. versicolor — V

Lachnaea eriocephala — R
Leucadendron corymbosum — V

- L. levisanus* — E
L. thymifolium — E
L. verticillatum — E
Leucospermum gueinzii — R
Lobostemon bolusii — E
L. hottentoticus — R
- Marasmodes undulata* — E
Monadenia physodes — I
Moraea cooperi — V
M. tulbaghensis — V
Muraltia guthriei — R
Myrica integra — U
- Osteospermum hispidum* var *viride* — I
- Paranomus spicatus* — R
Passerina paludosa — E
Pentaschistis zeyheri — U
Priestleya elliptica — I
P. glauca — I
P. laevigata — R
P. stokoei — E
P. vestita — U
Protea mucronifolia — R
P. odorata — E
Pterothrix perotrichoides — U
- Rafnia ericifolia* — I
Restio harveyi — E
Roella bryoides — U
- Schizodium longipetalum* — V
Senecio foeniculoides — I
Serruria brownii — R
S. candicans — V
S. incrassata — V
S. pinnata — V
S. roxburghii — E
- Tritoniopsis elongata* — I
- Urginea duthiae* — X
U. minor — I
U. pygmaea — I
U. revoluta — U
- Watsonia strictiflora* — U
- Coastal Renosterveld 2: Map 1 — R2**
- Acrolophia bolusii* — V
Agathosma capitata — R
A. corymbosa — E
A. glandulosa — V
A. marifolia — U
A. stenosepala — R
Arctotheca forbesiana — I
Aspalathus acanthophylla — I
A. latifolia — U
A. rectistyla — U
A. rycroftii — E
Athanasia rugulosa — V
- Babiana obliqua* — U
- Calopsis impolitus* — V
C. rigoratus var *simulans* — V
Chondropetalum acockii — E
C. rectum — V
Conophytum turrigerum — I
Corycium excisum — R
C. microglossum — R
Cullumia floccosa — U
- Diastella proteoides* — V
Diosma dichotoma — V
D. pedicellata — U
Diplosoma leipoldtii — I
D. retroversum — E
- Elegia prominens* — V
Erica crucistigmatica — E
E. ferrea — V
Euphorbia marlothiana — V
- Ferraria crispa* ssp *nortierii* — R
- Geissorhiza rogersii* — U
G. rubicunda — U
Gethyllis ciliaris — V
Gladiolus citrinus — E
G. ornatus — R
Grisebachia plumosa ssp *irrorata* — I
- Heliophila patens* — R
Hermannia procumbens ssp *myrrhifolia* — U
H. procumbens ssp *procumbens* — E
H. rugosa — V
Herschelianthe barbata — E
- Ischyrolepis duthiae* — V
Ixia conferta var *conferta* — U
I. conferta var *ochroleuca* — U
I. curta — V
I. rouxii — U
- Lachenalia polyphylla* — V
L. purpureo-caerulea — E
Leucadendron cinereum — V
L. corymbosum — V
L. thymifolium — E
Leucospermum parile — V
- Macrostylis barbiger* — R
M. villosa ssp *villosa* — I
Marasmodes oligocephalus — U
Monadenia physodes — I
Moraea amissa — E
M. gigandra — E
M. neopavonia — V
M. tulbaghensis — V
Myrica integra — U
- Nemesia strumosa* — R
- Othonna tephrosioides* — U
Oxalis callimarginata — U

O. fragilis var *fragilis* — I
O. fragilis var *pellucida* — I
O. involuta — R
O. luteola var *minor* — U
O. natans — E
O. perineson — V

Phyllica stenopetala — I
Polycarena capitata — I
Prionanthium pholiuroides — E
Protea odorata — E
Psilothonna speciosa — V
Pterygodium pentherianum — I

Relhania rotundifolia — E
Restio acockii — E
R. micans — E
R. papillosa — V
Romulea aquatica — V
R. tortilis var *dissecta* — R

Saphesia flaccida — E
Schizodium obliquum ssp *obliquum* — R
Serruria brownii — R
S. incrassata — V
S. linearis — V
Stoebe gomphrenoides — V

Thereianthus racemosus — R

Wahlenbergia serpentina — U
Watsonia dubia — U

Coastal Renosterveld 3: Map 1 — R3

Agathosma corymbosa — E
A. glabrata — X

Babiana obliqua — U
B. leipoldtii — I

Calopsis impolitus — V

Diosma aspalathoides — V
D. dichotoma — V
D. pedicellata — U
Disa ovalifolia — R

Echiostachys spicatus — R
Elegia verreauxii — V

Ficinia limosa — I

Galaxia alata — V
Geissorhiza furva — I
G. matthewsii var *matthewsii* — V
G. matthewsii var *eurystigma* — V
Gethyllis ciliaris — V
Gerbera wrightii — R
Gladiolus quadrangulus — E
Grisebachia incana — I
G. plumosa ssp *hirta* — I
G. plumosa ssp *irrorata* — I

Hermannia procumbens var *myrrhifolia* — U

Ixia maculata var *maculata* — V
I. curta — V
I. conferta var *ochroleuca* — U
I. framesii — E

Lachenalia purpureo-caerulea — E
Leucadendron cinereum — V
Leucospermum tomentosum — V
L. parile — V
Limonium purpuratum — I

Monopsis flava — U
Muraltia harveyana — I

Nemesia strumosa — R

Psilothonna speciosa — V

Relhania rotundifolia — E
Romulea eximia — V
R. saldanhensis — V
Ruschia firma — R

Urginea forsteri — U

Coastal Renosterveld 4: Map 1 — R4

Hermannia procumbens var *myrrhifolia* — U

Leucadendron brunioides var *flumenlupinum* — R

Stapelia nouhuysii — V

Wahlenbergia constricta — U

Mountain Fynbos 1: Map 1 — MF1

Hermannia rugosa — I

Leucadendron argenteum — R

Senecio expansus — U
Serruria incrassata — V
Spiloxene minuta — I

Wahlenbergia ciliolata — U

Mountain Fynbos 2: Map 1 — MF2

Agathosma glandulosa — V

Conophytum turrigerum — I

Erica hippurus — R

Ischyrolepis duthieae — V

Serruria brownii — R
S. candicans — V

S. incrassata — V
S. roxburghii — E

Mountain Fynbos 3: Map 1 — MF3

Conophytum turrigerum — U

Diosma pedicellata — U

Leucadendron corymbosum — V
Lotononis villosa — U

Moraea neopavonia — V

Serruria roxburghii — E

WESTERN MOUNTAIN REGION

Piketberg: Map 2 — P

Agathosma capitata — R

A. marifolia — U

Aspalathus glossoides — U

A. latifolia — U

A. rectistyla — U

Bobartia orientalis ssp occidentalis — R

Diplosoma retroversum — E

Conophytum luckhoffii — I

C. turrigerum — I

Engysiphon brevitubus — R

Euchaetis tricarpellata — U

Euryops pectinatus — R

Ferraria crispa ssp nortierii — R

Gladiolus stokoei — E

Gnidia parviflora — U

Heliophila patens — R

Hermannia cordifolia — I

H. hispidula — I

H. repetenda — U

Ixia maculata var intermedia — U

I. splendida — R

Kensitia pillansii — R

Leucadendron discolor — R

Leucospermum arenarium — R

L. catherinae — R

L. profugum — E

Moraea gigandra — E

Osteospermum aciphyllum — V

Othonna tephrosioides — U

Phylica cuspidata — U

Priestleya laevigata — R

Prionanthium ecklonii — U

Psoralea bolusii — I

Relhania latifolia — U

Sorocephalus imbricatus — E

Stapelia immelmaniae — V

Wahlenbergia tomentosula — U

Kouebokkeveld, Cedarberg,

Olifants R. Mts.: Map 2 — K

Acmadenia macradenia — R

A. patentifolia — R

Adenandra marginata ssp mucronata — R

A. villosa ssp pedicellata — I

Agathosma adnata — R

A. bicolor — R

A. conferta — R

A. cordifolia — U

A. dentata — R

A. distans — R

A. lancifolia — U

A. pattisonae — U

A. salina — R

Alciopse lanata — U

Anisodonteia gracilis — U

A. racemosa — U

Arctotis parvifolia — U

Aristea singularis — R

Askidiosperma longiflorum — V

Aspalathus compacta — U

A. corniculata — U

A. decora — U

A. desertorum — R

A. esterhuyseniae — R

A. fasciculata — R

A. florulenta — U

A. lenticula — U

A. rectistyla — U

A. suaveolens — R

A. sulphurea — U

Asterochaete schlechteri — U

Athanasia capitata — I

A. tomentella — U

Babiana auriculata — R

B. cedarbergensis — R

Berkheya dregei — U

Bobartia fasciculata — U

Bulbine uragineoides — U

Cadiscus aquaticus — E

Calopsis levynsiae — R

Cannomois aristata — R

Cheilanthes depauperata — U

Chlorophytum monophyllum — U

Cliffortia cymbifolia — U

C. reticulata — U

Corycium deflexum — U

Cotula pedunculata — U

Crassula alcornis — X

C. elsieae — R

C. namaquensis ssp comptonii — R

C. namaquensis ssp lutea — U

Cryptocarya angustifolia — U

Cyphia dentariaefolia — U

C. ranunculifolia — R

C. stephensii — U

Diastella parilis — V

Didymaotus lapidiformis — V

Diosma pedicellata — U

Disa longifolia — R

- D. marlothii* — R
D. minor — R
D. neglecta — R
D. ovalifolia — R
D. salteri — R
Disperis macrocorys — R

Elegia fastigiata — X
E. stokoei — V
Erica aspalathoides — U
E. auriculata — U
E. eriophoros — U
E. greyii — U
E. junonia var *junonia* — E
E. latifolia — U
E. leucosiphon — R
Eriospermum patentiflorum — U
Euchaetis esterhuysenae — R
Euphorbia rudolfii — U
Euryops brevilobus — R
E. zeyheri — U
Evota venosa — E

Ferraria crispa ssp *nortierii* — R
Ficinia gydomontana — R

Galaxia alata — V
G. variabilis — U
Geissorhiza geminata — U
G. ixioides — U
G. leipoldtii — U
G. pappei — U
G. rubicunda — U
Gethyllis unilateralis — U
Gladiolus buckerveldii — R
G. delpierrei — R
G. exilis — R
G. hyalinus — I
G. oreocharis — R
G. recurvus — I
G. violaceo-lineatus — R
G. watermeyerii — R
Gnidia parviflora — U
Grisebachia ciliaris ssp *bolusii* — I
G. ciliaris ssp *involuta* — I
G. minutiflora ssp *nodiflora* — I
G. secundiflora — I

Heliophila cedarbergensis — R
Hermannia helicoidea — R
H. repetenda — U
Holothrix confusa — I
Homeria autumnalis — I
H. cedarmontana — R
H. fuscumontana — I
H. patens — R

Ischyrolepis esterhuysenae — R
I. setiger — U
Ixia rouxii — U

Juncus fasciculiflorus — U

Lachenalia esterhuysenae — U
L. margaretae — U
Lachnaea elegans — U

Leucadendon bonum — E
L. chamelaea — E
L. concavum — R
L. corymbosum — V
L. diemontianum — R
L. sericeum — E
Leucospermum catherinae — R
Leysera longipes — R
Lightfootia brachyphylla — U
L. multicaulis — U
Lobelia nuxax — U
Lotononis macra — R
L. pallens — U

Macrostylis barbiger — R
M. ramulosa — R
Monopsis arenaria — U
M. flava — U
Moraea barkeri — R
M. tulbaghensis — V
Muraltia angustiflora — I
Myrica integra — U

Nestlera tricephala — U

Ornithogalum thermophilum — U
Oxalis dines — U
O. involuta — R
O. lindaviana — I
O. lineolata — I
O. lutea var *minor* — U
O. oreophila — U
O. porphyriosiphon — U
O. simplex — U

Paranomus tomentosus — R
Phylica alpina — U
P. altigena — U
P. barbata — U
P. chionocephala — U
P. fruticosa — R
P. leipoldtii — U
P. levynsiae — U
P. maximiliana — U
P. pauciflora — U
P. plumigera — R
P. salteri — U
P. stenopetala — I
P. trachyphylla — U
Pleiospilos prismaticus — E
Polycarena minimum — U
P. parvula — U
Priestleya tecta — R
Prionanthium ecklonii — U
Prismatocarpus decurrens — U
P. implicatus — U
P. pauciflorus — U
P. pilosus — U
Protea inopina — R
P. mucronifolia — R
P. pityphylla — V
Psoralea striata — U

Relhania foveolata — R
Restio brunneus — R

R. distans — R
R. filicaulis — U
R. tuberculatus — U
Romulea albomarginata — R
R. biflora — R
R. cedarbergensis — U
R. sulphurea — X
R. tortilis var *dissecta* — R
R. tortilis var *tortilis* — R
R. vinacea — R
R. viridibracteata — U

Senecio diodon — U
S. foeniculoides — I
Serruria confragosa — R
S. flava — R
S. leipoldtii — R
S. triternata — R
Sorocephalus imbricatus — E
S. scabridus — V
Spatalla tulbaghensis — E
Spiloxene umbraticola — U
S. minuta — I
Stapelia erectiflora — R
S. parvipuncta var *truncata* — U
Strumaria salteri — U

Thamnea depressa — X
T. hirtella — V
Thereianthus racemosus — R
Trianoptiles solitaria — I
Tritoniopsis latifolia — R

Ursinia coronopifolia — R
U. chrysanthemoides var *geyeri* — R
U. subflosculosa — R

Wahlenbergia brachycarpa — I
W. distincta — U
W. tomentosula — U
Watsonia dubia — U
Widdringtonia cedarbergensis — V

Citrusdal Valley: Map 2 — CIV

Agathosma salina — R

Conophytum edwardsiae — I
C. luckhoffii — I
C. turrigerum — I

Diosma pedicellata — U
Disa ovalifolia — R

Geissorhiza lewisae — I

Hermannia helicoidea — R

Ixia conferta var *conferta* — U
I. versicolor — I

Phylica alpina — U
P. plumigera — R
Pterygodium pentherianum — I

Spiloxene maximiliana — U
S. umbraticola — U
Synnotia roxburghii — I

Watsonia cooperi — U

Tulbagh Valley: Map 2 — TV

Bulbine minima — U

Cliffortia reticulata — U
Corycium excisum — R
C. microglossum — R

Diastella parilis — V

Elegia extensa — I

Geissorhiza furva — I

Huernia witzenbergensis — E

Ixia campanulata — I
I. viridiflora — V

Juncus obliquus — U

Lachenalia polyphylla — V
L. purpureo-caerulea — E
Leucadendron chamelaea — E
L. corymbosum — V
L. spirale — X

Moraea neopavonia — V
M. tulbaghensis — V

Prismatocarpus implicatus — U
Protea mucronifolia — R

Rafnia crispa — I

Sorocephalus imbricatus — E

Ursinia coronopifolia — R

Venidium angustifolium — U

Watsonia ardernei — U
W. wordsworthiana — U

Ceres Valley: Map 2 — CV

Agathosma concava — R
Anaxeton angustifolium — U
Aspalathus desertorum — R

Crassula namaquensis ssp *lutea* — U

Didymaotus lapidiformis — V
Diosma flavescens — I

Erica leucosiphon — R

Galaxia variabilis — U
Geissorhiza pappei — U

Lachnaea elegans — U

Monopsis flava — U

Nestlera tricephala — U

Stapelia glanduliflora — V

Venidium angustifolium — U

Hexrivier Mountains: Map 2 — H

Acmadenia matroosbergensis — R

A. tenax — R

Agathosma concava — R

A. foleyana — R

A. phillipsii — R

Askidiosperma longiflorum — V

Aspalathus desertorum — R

A. orbiculata — U

A. pilantha — U

A. rostrata — U

Athanasia crassifolia — U

A. spathulata — U

Brunia macrocephala — R

Caralluma pillansii — I

Cryptocaria angustifolia — U

Disa brachyceras — U

D. longifolia — R

D. marlothii — R

D. minor — R

Disperis bodkini — R

Erica atrovinosa — E

E. junonia var junonia — E

E. keeromsbergensis — R

Ficinia gydomontana — R

Galaxia variabilis — U

Gladiolus cardinalis — R

G. oreocharis — R

Heliophila filicaulis — R

Ischyrolepis duthiae — V

I. fuscidulus — R

Leysera longipes — R

Moraea nubigena — R

Muraltia serrata — U

Ornithogalum esterhuyseniae — R

Oxalis henrici — U

Phyllica reversa — U

Priestleya myrtifolia — U

P. tomentosa — R

Prismatocarpus implicatus — U

Protea holosericea — E

P. pityphylla — V

Restio aureolus — I

Thamnochortus acuminatus — R

Venidium angustifolium — U

V. macrospermum — U

Hexrivier Valley: Map 2 — HV

Athanasia palmitifida — U

Cryptocaria angustifolia — U

Diclis stellarioides — I

Geissorhiza rogersii — U

Gethyllis multifolia — V

Hermannia helicoidea — R

Marasmodes oligocephalus — U

Nestlera tricephala — U

Oxalis henrici — U

O. lindaviana — I

Priestleya rogersii — U

Protea pityphylla — V

Senecio rehmanni — U

S. succulentus — U

Stapelia vetula var simsii — U

Slanghoek Mountains: Map 2 — S

Adenandra villosa ssp imbricata — R

A. villosa ssp robusta — R

Agathosma decurrens — U

A. stenosepala — R

Alciope lanata — U

Anaxeton ellipticum — R

Anisodonteia dissecta — V

Arctotis aenea — U

Aspalathus erythrodes — U

A. truncata — U

Athanasia hameri — U

Bobartia lilacina — R

Charadrophila capensis — V

Chasmanthe bicolor — U

Cliffortia cymbifolia — U

C. intermedia — U

C. multiformis — U

C. strigosa — I

Corycium rubiginosum — U

Cryptocaria angustifolia — U

Diastella buekii — E
D. parilis — V
D. myrtifolia — R
Diosma pedicellata — U
Disa neglecta — R
D. tenuis — R
Drosera regia — R

Elegia stokoei — V
Erica bakeri — E
E. chrysocodon — E
E. cremea — R
E. cryptanthera — U
E. hibbertia — R
E. intricata — R
E. lerouxiae — V
E. parvulisepala — R
E. purgatoriensis — V
Euryops decipiens — R
Evota venosa — E

Galaxia barnardii — U
Geissorhiza geminata — U
G. leipoldtii — U
G. ovalifolia — U
Gladiolus blommesteinii — I
G. cardinalis — R
G. exilis — R
Grisebachia rigida — V

Hippia hirsuta — U

Ixia rouxii — U

Lapeirousia corymbosa ssp alta — U
Leucadendron corymbosum — V
L. comosum ssp homeophyllum — I
Lightfootia brachyphylla — U

Mairia decumbens — U
Metalasia schlechteri — U
Monadenia macrostachya — E
Moraea incurva — X
M. tulbaghensis — V
Myrica integra — U

Nemesia picta — R
Nerine pudica — R

Oldenburgia papilionum — R
Oxalis natans — E

Pachites bodkini — V
Phylica ampliata — E
P. comosa — U
P. guthriei — U
P. nodosa — U
Platycaulos coactilis — V
P. subcompressus — I
Priestleya elliptica — I
P. laevigata — R
P. myrtifolia — U
P. stokoei — E
P. tecta — R
Protea mucronifolia — R

Scilla plumbea — R
Senecio expansus — U
Serruria candicans — V
S. florida — E
S. triternata — R
S. zeyheri — R
Sorocephalus imbricatus — E
S. teretifolius — R
Spatalla propinqua — I
S. salsoloides — R
Staavia dregeana — I
Stylapterus ericoides ssp ericoides — V
S. ericoides ssp pallidus — R
S. sulcatus — R

Thamnea uniflora — X

Venidium angustifolium — U
V. macrospermum — U

Wahlenbergia mollis — U
W. schistacea — U
Watsonia rosea-alba — I
W. stanfordiae — I
W. strictiflora — U
Willdenowia purpurea — R

Hottentot's Holland Mts.: Map 2 — Ho

Acnadenia alternifolia — U
A. candida — X
A. nivea — V
Adenandra multiflora — I
Agapanthus walshii — R
Agathosma stokoei — R
Anaxeton ellipticum — R
Argyrobium aciculare — U
Aristea recisa — U
Aspalathus acanthiloba — U
A. concava — U
A. macrantha — U
A. stokoei — R
A. vacciniifolia — U

Berzelia dregeana — R
B. ecklonii — R
Bobartia lilacina — R

Calopsis rigoratus var simulans — V
Ceratocaryum fistulosum — I
Charadrophila capensis — V
Cliffortia carinata — U
C. intermedia — U
C. monophylla — U
C. multiformis — U
C. reticulata — U
Corycium bifidum — I
C. rubiginosum — U
Cotula paradoxa — U
Crassula multiflora ssp leucantha — U
Cryptadenia laxa — U

Disa begleyi — U
D. brachyceras — U

- D. hallackii* — E
D. pillansii — R
D. tenuis — R
- Elegia verreauxii* — V
Erica cabernetii — R
E. cerviciflora — U
E. calvisepala — R
E. comptonii — R
E. dulcis — R
E. fervida — U
E. gallorum — U
E. lowryensis — R
E. nana — R
E. patersoniae — R
E. pillansii — V
E. porteri — V
E. turbiniflora — U
E. turgida — X
E. ustulescens — I
E. vallis-araneorum — R
E. vestiflua — R
Euchaetis schlechteri — R
Eulophia litoralis — I
Euryops indecorus — R
Evota venosa — E
- Gladiolus blommesteinii* — I
G. martleyi — U
G. nerineoides — U
G. vigilans — V
Glischrocolla formosa — V
Gnaphalium simii — I
Grammitis poeppigiana — R
Grubbia rourkei — R
- Haemanthus canaliculatus* — V
Harveya euryantha — U
Heliophila cuneata — V
H. ramosissima — U
H. tricuspidata — R
Hermannia concinnifolia — I
H. rudis — I
Herschelianthe forficaria — R
Homeria comptonii — V
Hypodiscus alternans — I
- Ischyrolepis duthiae* — V
Ixia cochlearis — U
I. versicolor — V
- Klattia partita* — R
- Lachenalia campanulata* — I
Lapeirousia corymbosa ssp *alta* — U
Leucadendron globosum — V
L. platyspermum — V
Leucospermum bolusii — V
L. cordatum — R
L. gueinzii — R
Lobostemon bolusii — E
L. hottentoticus — V
L. lucidus — U
Lonchostoma purpureum — R
- Metalasia bodkinii* — U
Mimetes capitulatus — R
M. hirtus — V
M. hottentoticus — E
M. stokoei — X
Monadenia pygmaea — U
M. sabulosa — R
Muraltia aciphylla — I
M. capensis — U
M. chamaepitys — R
Myrica integra — U
- Nivenia concinna* — I
N. levynsiae — I
N. stokoei — I
- Ornithogalum esterhuyseniae* — R
Orothamnus zeyheri — R
Osteospermum wallianum — U
- Pachites bodkini* — V
Paranomus adiantifolius — R
P. spicatus — R
Pentameris obtusifolia — U
P. squarrosa — U
Phyllica diosmoides — U
P. laevis — U
P. leipoldtii — U
P. limifolia — U
Platycaulos cascadenis — R
P. subcompressus — I
Podalyria cordata — V
Priestleya elliptica — I
P. glauca — U
P. laevigata — R
P. leiocarpa — U
P. myrtifolia — U
P. stokoei — E
P. thunbergii — U
Prismatocarpus cordifolius — R
Pteronia scabra — U
- Restio distans* — R
R. festucaeformis — V
R. fusiformis — R
R. involutus — R
Roella lightfootioides — U
Roridula gorgonias — R
- Satyridium rostratum* — V
Satyrium foliosum — R
Serruria florida — E
S. inconspicua — R
S. meisneriana — R
Solanum crassifolium — I
Sonderothamnus petraeus — R
Sorocephalus palustris — E
S. tenuifolius — X
Spatalla prolifera — E
S. propinqua — I
Stylapterus barbatus — R
S. micranthus — E
S. sulcatus — R

Tetradia compacta — U
Thaminophyllum multiflorum — U
T. mundii — R
Thamnea uniflora — X
Thamnohortus dumosus — V
T. fraternus — R
T. pellucidus — V
Trianoptiles stipitata — I

Urginia revoluta — U

Watsonia caledonica — U
W. pauciflora — U
W. rogersii — U
W. stanfordiae — I
W. strictiflora — U
Willdenowia purpurea — R
Witsenia maura — R

Theewaterskloof: Map 2 — Th

Chondropetalum rectum — V

Disa brachyceras — U
D. longifolia — R

Erica vogelpoelii — I

Galaxia barnardii — U
Geissorhiza geminata — U

Homeria comptonii — V

Ixia bellendenii — U
I. patens var *linearifolia* — I

Leucadendron elimense ssp *vyeboomense* — E

Osteospermum aciphyllum — V

Roella bryoides — U

Satyridium rostratum — V
Serruria zeyheri — R
Sparaxis fragrans — V

Redelinghuys Swartberg: Map 2 — RS

Acmadenia macradenia — R
Agathosma cephalodes — U
A. elata — U
A. involucreta — E
A. marifolia — U

Calopsis impositus — V
Caralluma inversa — I
Cullumia floccosa — U
C. micrantha — U

Diascia rudolphi — U

Gladiolus comptonii — R
G. violaceo-lineatus — R
Grisebachia plumosa ssp *hispida* — I

Hermannia procumbens var *myrrhifolia* — U

Leucadendron sericeum — E
Leucospermum catherinae — R
Lobostemon hottentoticus — V

Macrostylis cassiopoides ssp *cassiopoides* — R
M. hirta — R

Oxalis dines — U

Pelargonium appendiculatum — R
Pentaschistis hirsuta — U

Roella latiloba — U
Relhania latifolia — U
Romulea vinacea — R

Stapelia glanduliflora — V

Wahlenbergia massonii — U

Clanwilliam Valley: Map 2 — OV

Adromischus marianae — U
Agathosma lancifolia — U
Arctotis fosteri — U
Aspalathus decora — U

Babiana obliqua — U

Caralluma intermedia — I
C. inversa — I
Conophytum luckhoffii — I
Corycium excisum — R
Cullumia floccosa — U

Erica leucosiphon — R
Eriospermum patentiflorum — U

Ferraria crispa ssp *nortierii* — R
F. foliosa — U

Grisebachia plumosa ssp *hispida* — I

Hermannia helicoidea — R
Hessea leipoldtii — R
Holothrix confusa — I
Homeria bolusiae — I
H. patens — R

Myrica integra — U

Ornithogalum thermophilum — U

Prionanthium ecklonii — U
Pterygodium pentherianum — I

Senecio diodon — U
Spiloxene maximiliani — U
Stapelia glanduliflora — V
Synnotia roxburghii — I

Trachyandra adamsonii — U

Wahlenbergia brachycarpa — I

W. constricta — U

W. subtilis — U

Bokkeveld Mountains: Map 2 — B

Agathosma elata — U

A. marifolia — U

Anisodonteia racemosa — U

Arctotis aenea — U

Aspalathus florulenta — U

A. obliqua — U

Athanasia tomentella — U

Babiana klaverensis — U

Brunsvigia minor — R

Bulbine minima — U

Calopsis impolitus — V

Cliffortia acutifolia — I

Crassula namaquensis ssp *comptonii* — R

C. pellucida ssp *spongiosa* — R

C. socialis — R

Cullumia pectinata — R

Diosma pedicellata — U

Elytropappus hispidus — R

Erica sonora — U

Euryops rosulatus — R

Gladiolus comptonii — R

G. mostertiae — R

G. uysiae — I

G. violaceo-lineatus — R

G. watermeyerii — R

Gnidia leipoldtii — U

Grisebachia plumosa ssp *eciliata* — I

Haemanthus nortieri — R

Helichrysum filagineum — U

Heliophila collina — R

Hermannia repetenda — U

Hessea unguiculata — U

Holothrix confusa — I

Homeria bolusiae — I

H. patens — R

H. vallisbelli — R

Hyaenanche globosa — V

Ixia curvata — U

I. maculata var *intermedia* — U

I. patens var *patens* — I

Laurentia giftbergensis — V

Leucadendron remotum — R

L. roodii — E

L. stelligerum — V

Macrostylis cassiopoides ssp *cassiopoides* — R

Manulea glandulosa — U

Moraea macgregorii — R

Oophytum oviforme — I

Ornithogalum inclusum — U

O. pruinatum — R

Othonna cacalioides — U

O. minima — R

O. papaveroides — U

Oxalis comptonii — U

O. lineolata — I

O. massoniana var *massoniana* — U

O. massoniana var *flavescens* — U

O. melanosticta var *latifolia* — U

O. oligophylla — U

O. oreithala — U

O. purpurata — U

O. simplex — U

O. tenuis — U

Paranomus tomentosus — R

Phylica affinis — U

P. agathosmoides — U

Polygala lasiosepala — U

Priestleya schlechteri — U

Prismatocarpus pauciflorus — U

Romulea amoena — R

R. multisulcata — I

R. sladenii — R

R. toximontana — R

Sparaxis tricolor — I

Stapelia cyclista — R

S. glanduliflora — V

Strumaria picta — U

S. salteri — U

S. watermeyerii — U

Trachyandra gracilentia — U

Tridentea longii — I

Ursinia pygmaea — U

U. subflosculosa — R

Wahlenbergia asperifolia — U

W. longisepala — U

Kamiesberg: Map 3 — Ka

Androcymbium scabromarginatum — U

Berrisfordia khamiesbergensis — I

Bulbine uragineoides — U

Crocsmia fucata — U

Erica dilatata — U

Euryops subcarnosus ssp *minor* — R

Felicia deserti — U

F. diffusa ssp *khamiesbergensis* — R

Ferraria khamiesbergensis — R

F. uncinata ssp *macrochlamys* — U

Galaxia grandiflora — E
Gladiolus equitans — I
G. kamiesbergensis — R

Helictotrichon barbatum — U
H. namaquense — U
Hesperantha latifolia — U
Homeria pendula — I

Juncus parvulus — U
J. polytrichus — U

Massonia laeta — U
Monadenia macrostachya — E
M. physodes — I
Moraea longiflora — R

Ornithogalum pilosum ssp pullatum — U
Oxalis reclinata var gracillima — U

Phylica retrorsa — U
Polycarena minimum — U
Polygala lasiosepala — U

Relhania conferta — U
Restio vilis — R
Roella bryoides — U
Romulea kamisensis — R
R. oliveri — R

Tenicroa nana — U

KAROO REGION

Worcester Karoo and Marginal Fynbos: Map 3 — 1

Adenandra villosa ssp *imbricata* — R
A. villosa ssp *robusta* — R
Agathosma leptospermoides — R
Anisodonteia gracilis — U
Apodolirion lanceolatum — R
Arctotis rosea — U
Aspalathus burchelliana — U
A. macrocarpa — U
Athanasia crassifolia — U

Caralluma arenicola — X
Ceropegia connivens — U
Cliffortia carinata — U
Cliffortia lanata — U

Diascia nana — U
Diastella parilis — V
Diosma pedicellata — U

Euphorbia nesemannii — V

Geissorhiza geminata — U
G. leipoldtii — U
G. rubicunda — U
Gladiolus tristis var *concolor* — U
G. virescens var *roseo-venosus* — R
Grisebachia rigida — V

Haworthia marginata — I
H. rubriflora — I

Ixia campanulata — I

Lampranthus arbuthnotiae — U
Leucadendron flexuosum — E
L. chamelaea — E
Lightfootia effusa — U
Lobostemon gracilis — U

Moraea cooperi — V

Othonna miser — U
Oxalis natans — E

Poellnitzia rubriflora — I
Polhillia waltersii — I
Priestleya capitata — R
Pterothrix flaccida — U

Ruschia amicorum — R
R. leipoldtii — E

Scirpus delicatulus — I
Senecio rehmannii — U
Stapelia concinna var *concinna* — E
Stilpnophytum oocephalum — U
Sutera cephalotes — U

Urginea forsteri — U

Watsonia caledonica — U
W. cooperi — U

Little Karoo and Marginal Fynbos: Map 3 — 2

Acmadenia argillophila — V
Adenandra dahlgrenii — R
Agathosma florida — U
Anisodonteia pseudocapensis — U
A. theronii — U
Apodolirion lanceolatum — R
Aspalathus lamarckiana — U
A. longifolia — U

Blepharis inermis — U

Caralluma arenicola — X
C. arida — U
Cheilanthes depauperata — U
Crassula rupestris ssp *marnierana* — U
Crassula subulata var *hispida* — X
Crotalaria lebeckioides — U
Cyphia longilobata — U
Cyrtanthus clavatus — R

Delosperma macrostigma — U
Didymaotus lapidiformis — V
Diosma passerinoides — R
D. strumosa — V
Duvalia parviflora — I

Eriospermum flabellatum — U
Euphorbia colliculina — U

Freesia speciosa — V
Freylinia decurrens — I

Gethyllis unilateralis — U
Gibbaeum angulipes — U
G. nebrownii — V
G. pachypodium — U
Gladiolus emiliae — E
G. leptosiphon — U
G. lewisiae — E

Haworthia blackburniae — R
H. maughanii — I
H. truncata — U
Helichrysum archeri — U
H. cochleariforme — U
H. simulans — U
Holothrix grandiflora — U
H. pilosa — I
Hoodia pillansii — I
Huernia praestans — I

Ixia cochlearis — U
I. gloriosa — I
I. leipoldtii — U

Lachnostylis bilocularis — V
Leucospermum pluridens — R
Lobostemon muirii — U

Metalasia tricolor — U
Muraltia karroica — I

Ornithogalum diluculum — U
Othonna pinnatiflobata — U
Oxalis anomala — U
O. attenuata — U
O. dichotoma — U
O. microdonta — I
O. orbicularis — U

Paranomus longicaulus — V
Pelargonium appendiculatum — R
Phylica wittebergensis — U
Priestleya angustifolia — U
Psoralea striata — U

Relhania resinifera — R
Romulea jugicola — I
R. malaniae — U
R. sphaerocarpa — I
Ruschia amicorum — R
R. leipoldtii — E

Scelletium ovatum — I
S. haworthii — U
Syringodea derustensis — R
S. saxatilis — U

Tanquana hilmari — V
Trichodiadema burgeri — R
T. hallii — R
Tylecodon cacalioides — V

Wahlenbergia tumida — U

Steytlerville Karoo: Map 3 — 3

Atalaya capensis — R

Caralluma arenicola — X
C. pillansii — I
Chasmatophyllum maninum — U
Cyclopia burtonii — I

Encephalartos lehmannii — R
E. longifolius — V
Euphorbia symmetrica — I

Faurea macnaughtonii — R

Haworthia springbokvlakensis — I

Leucadendron nobile — R
Lobostemon lucidus — U

Nerine peersii — U

Pleiospilos kingiae — U

Relhania patersoniae — U

Scelletium expansum — I
Stapelianthus baylissii — I
Strelitzia juncea — R

Trichocaulon annulatum — R
Trichodiadema aurea — I
T. densum — R
T. peersii — I
Tridentea baylissii — I

Noorsveld: Map 3 — 4

Encephalartos lehmannii — R
E. longifolius — V

Stapelia macowanii — I

Trichocaulon annulatum — R

Great Karoo, Main Area: Map 3 — 5a

Caralluma arenicola — X
C. bredae var *bredae* — R
C. linearis — R
Chasmatophyllum maninum — U
Cliffortia arborea — R
Crassula alpestris ssp *massonii* — U
C. brachystachya — U
C. socialis — R

Diosma passerinoides — V
Duvalia parviflora — I

Encephalartos lehmannii — R
Eriospermum exilis — U
E. flabellatum — U
Euphorbia eustacei — U
E. multifolia — U
E. symmetrica — I

Faucaria longidens — U
Freesia speciosa — V

Gibbaeum angulipes — U
G. nebrownii — V
Gladiolus leptosiphon — U

Helichrysum archeri — U
H. simulans — U
Hermannia pillansii — I
Hessea karroica — R
Hoodia dregei — I
H. pillansii — I
Huernia distincta — R
H. humilis — I
H. insigniflora — I

Ixia trifolia — U

Lobelia dichroma — U

Muiria hortenseae — E

Nemesia pallida — U

Nestlera tricephala — U

Othonna lasiocarpa — U

O. miser — U

O. pteronioides — R

O. tephrosioides — U

Pelargonium hystrix — R

Psoralea macradenia — I

Pterothrix perotrichoides — U

Relhania resinifera — R

Rhinephyllum inaequale — I

Rosenia angustifolia — U

Senecio erysimoides — U

S. haworthii — U

Tanquana hilmari — V

Trichocaulon annulatum — R

Trichodiadema densum — R

T. obliquum — I

Venidium bolusii — U

Wahlenbergia brachycarpa — I

Great Karoo, Camdeboo Area: Map 3 — 5b

Apodolirion bolusii — R

Corycium tricuspdatum — I

Diascia ramosa — U

Duvalia maculata — I

Encephalartos cycadifolius — V

E. lehmannii — R

E. longifolius — V

Eulophia meleagris — I

Euphorbia obesa — I

Euryops dentatus — R

Kniphofia acraea — I

Nerine huttoniae — U

Othonna spinescens — U

Rhinephyllum inaequale — I

Rhus krebsiana — U

Wahlenbergia bowkeri — U

Tanqua (Ceres) Karoo: Map 3 — 6

Agathosma cordifolia — U

Aspalathus bidouwensis — I

A. comptonii — R

Caralluma gracilis — U

C. longipes — I

Cheilanthes depauperata — U

Chlorophytum lewisae — U

Crassula alpestris ssp *massoni* — U

C. namaquensis ssp *lutea* — U

Cyphia comptonii — U

Diascia ramosa — U

Didymaotus lapidiformis — V

Dorotheanthus bidouwensis — I

Euphorbia hallii — R

Euryops brevilobus — R

Gladiolus watermeyerii — R

Helichrysum concinnum — U

Holothrix confusa — I

Homeria fenestrata — I

H. vallisbellii — R

Ixia brevituba — V

Lithops comptonii — E

Ornithogalum bicornutum — U

Oxalis dines — U

Pleiospilos prismaticus — E

Pterothrix perotrichoides — U

Pterygodium pentherianum — I

Senecio erysimoides — U

Stapelia dwequensis — E

S. erectiflora — R

S. nouhuysii — V

S. parvipuncta var *truncata* — U

S. thudichumii — R

Tridentea parvipuncta — I

Tylecodon striatus — R

Ursinia chrysanthemoides var *geyeri* — R

Vanrhynsdorp Karoo: Map 3 — 7

Aloe buhrii — R

Babiana lobata — U

B. pauciflora — U

B. pilosa — U

B. salteri — R

B. stenomera — R

B. torta — U

Bulbine brunsvigiaefolia — U

Caralluma cincta — V

C. gracilis — U

- C. inversa* — I
C. maughanii — R
C. villetii — R
Carpolyza spiralis — U
Conophytum luckhoffii — I
Cotula loganii — U
Crassula alpestris ssp *massoni* — U
C. multiceps — R
Cullumia pectinata — R
Cyphia longiflora — U
C. oligotricha — U
C. salteri — U
- Diascia rudolphi* — U
D. scullyi — U
- Echidnopsis framesii* — R
Eriospermum minutiflorum — U
Euphorbia fasciculata — V
E. rudolfii — U
- Ferraria brevifolia* — R
F. divaricata ssp *aurea* — U
F. foliosa — U
F. kamiesbergensis — R
F. uncinata var *macrochlamys* — U
- Galaxia ciliata* — R
Gethyllis herrei — V
G. latifolia — X
Gladiolus lapeirousioides — E
- Helichrysum filagineum* — U
H. leptorhizum — U
Heliophila laciniata — R
H. leptophylla — U
H. patens — R
Hessea spiralis — U
Homeria ramosissima — R
H. spiralis — R
- Lachenalia concordiana* — I
Limonium teretifolium — R
Lithops divergens — V
- Maughaniella insignis* — I
M. luckhoffii — I
- Oophytum oviforme* — I
Ophthalmophyllum verrucosum — I
Ornithogalum hallii — V
O. naviculum — U
Othonna abrotanifolia — U
O. cakilefolia — U
O. hallii — R
O. lepidocaulis — U
Oxalis blastorrhiza — U
O. cathara — U
O. crispula var *crispula* — U
O. crispula var *glandulosa* — U
O. cuneata — U
O. deserticola — R
O. dines — U
O. lichenoides — R
- O. massoniana* var *flavescens* — U
O. melanograpta — R
O. reclinata var *reclinata* — U
O. rhomboidea — U
O. senecta — R
- Pleiospilos prismaticus* — E
Pteronia inflexa — U
P. pillansii — U
Pterothrix cymbaefolia — U
P. flaccida — U
- Relhania silicicola* — R
Romulea biflora — R
R. kamisensis — R
R. tortilis var *dissecta* — R
Ruschia firma — R
- Sineoperculum rourkei* — U
Stapelia concinna var *paniculata* — R
Strumaria salteri — U
- Trichocaulon simile* — U
- Ursinia pygmaea* — U
- Wahlenbergia annuliformis* — I
W. busseriana — R
- Namaqualand: Map 3 — 8**
- Adenoglossa decurrens* — U
Adromischus diabolicus — I
Ammocharis herrei — R
Amphiglossa corrudaefolia — U
Androcymbium cruciatum — U
A. hennsenianum — U
A. poeltianum — U
A. villosum — U
A. vogelii — U
Arctotis crispata — U
Athanasia tomentella — U
- Babiana brachystachys* — U
B. horizontalis — U
B. lobata — U
B. stenomera — R
B. striata var *planifolia* — R
Boophane pulchra — R
Brunsvigia herrei — R
Bulbine brunsvigiaefolia — U
- Caralluma acutiloba* — I
C. aperta — U
C. parviflora — I
C. pruinosa — I
Chrysanthemum decurrens — U
Crassula fusca — R
C. multiceps — R
C. susannae — I
Crocsmia fucata — U
Cyrtanthus herrei — R

Diascia scullyi — U
Dinteranthus vanzylii — V

Eriospermum cervicorne — U
E. filicaule — U
E. minutiflorum — U
E. pusillum — U
Euphorbia pentops — U
Euryops pleiodontus — I

Felicia deserti — U
Ferraria brevifolia — R
F. divaricata ssp *aurea* — U
F. kamiesbergensis — R
F. uncinata ssp *macrochlamys* — U

Galaxia ciliata — R
Geissorrhiza deserticolus — U
Gethyllis ciliaris — V
Gladiolus equitans — I
G. kamiesbergensis — R
G. salteri — R
G. viridiflorus — V

Helichrysum concinnum — U
H. filagineum — U
Heliophylla laciniata — R
Herreanthus meyeri — I
Hesperantha latifolia — U
Homeria ramosissima — R
Hyobanche barklyi — U

Lachenalia concordiana — I
L. namaquensis — I
L. polypodantha — U
L. verticillata — R
Lapeirousia verecunda — R
Limonium namaquanum — R
Lithops divergens — V

Matricaria schlechteri — U
Moraea indecora — R

Nelia pillansii — I
N. schlechteri — I
Nemesia glaucescens — U
Neopatersonia namaquensis — R

Oophytum oviforme — I
Ophthalmophyllum australe — I
O. littlewoodii — U
O. longitubum — U
O. spathulatum — U
O. vanheerdei — U
O. verrucosum — I
Ornithogalum deltoideum — U
O. geniculatum — R
O. pruinatum — R
O. unifoliatum — U
O. zebrinum — U
Osteospermum armatum — U
Othonna abrotanifolia — U
O. lasiocarpa — U
Oxalis cathara — U

O. creaseyi — U
O. crispula var *crispula* — U
O. crocea — U
O. extensa — U
O. reclinata var *gracillima* — U
O. virginea — R

Pachypodium namaquanum — V
Pellaea robusta — U
Phyllica pearsonii — U
Polygala lasiosepala — U
Psoralea striata — U
Pteronia pillansii — U

Restio vilis — R
Romulea kamisensis — R
R. namaquensis ssp *bolusii* — U
R. namaquensis ssp *namaquensis* — U

Sarcocaulon herrei — U
Schizodium longipetalum — V
Schwantesia australis — I
S. pillansii — I
S. speciosa — I
S. triebneri — I
Senecio albopunctatus — U
S. trachylaenus — U
Sphalmanthus arenicolus — U
Stapelia barklyi — I
S. dwequensis — E
S. neliana — I
S. rubiginosa — R
Stapeliopsis neronis — E

Trichocaulon alstoni — I
T. cinereum — R
T. pictum — I
T. simile — U
T. truncatum — R
Tridentea umdausensis — I
Tritonia kamisbergensis — U
Tylecodon rubrovenosus — R

Ursinia pygmaea — U

Wahlenbergia floribunda — U
W. lasiocarpa — U
W. namaquana — U
W. oligotricha — U
W. rara — U
W. roelliflora — U

Gariep Centre, Richtersveld: Map 3 — 9a

Babiana lobata — U

Calliandra redacta — R
Caralluma aperta — U
C. pruinosa — I
Crassula fusca — R
C. sericea var *velutina* — U

Echidnopsis columnaris — V

Heliophila eximia — R
Lachenalia namaquensis — I
L. verticillata — R
Ophthalmophyllum noctiflorum — U
Ornithogalum geniculatum — R
O. glandulosum — U
Pachypodium namaquanum — V
Schwantesia acutipetala — I
Stapelia gariensis — U
S. neliana — I
S. rubiginosa — R
S. umbonata — R
Stapeliopsis neronis — E
Trichocaulon alstoni — I
T. cinereum — R
T. halenbergensis — U
T. kubusense — I
Tylecodon pearsonii — R

Gariiep Centre, Coast: Map 3 — 9b

Juttadinteria albata — I
J. tetrastepala — I
Nelia pillansi — I
Stapelia gariensis — U
Tylecodon schaeferianus — U

Roggeveld: Map 3 — 10

Adromischus phillipsiae — R
Agathosma sabulosa — U
Arctotis diffusa — U
A. sulcocarpa — U
Caralluma longipes — I
Cliffortia arborea — R
Corycium deflexum — U
Crassula roggveldii — R
C. vestita — R
Daubenya aurea var coccinea — E
Diascia dissecta — U
Dorotheanthus booyseii — I
Eriospermum flabellatum — U
Euryops marlothii — R
Gladiolus marlothii — U
Helicotrichon namaquense — U
Ixia brevifolia — U
I. trifolia — U
Lachenalia congesta — U
Lithospermum flexuosum — U

Oxalis marlothii — U
Romulea hallii — U
R. komsbergensis — U
R. multifida — R
R. syringodeoflora — R
Stapelia thudichumii — R
Tridentea longii — I

Southern Bushmanland: Map 3 — 11

Adenandra marginata ssp mucronata — R
Amphisiphon stylosa — E
Androsiphon capense — R
Arctotis diffusa — U
A. sulcocarpa — U
Babiana pauciflora — U
B. virginea — U
Caralluma gracilis — U
C. longipes — I
C. maughanii — R
Cliffortia arborea — R
Conophytum luckhoffii — I
Cullumia pectinata — R
Daubenya aurea var aurea — U
Diascia nana — U
D. nutans — U
Disperis macrocorys — R
Euphorbia cylindrica — V
Euryops marlothii — R
E. mirus — U
E. rosulatus — R
E. virgatus — R
Ferraria kamiesbergensis — R
Gladiolus marlothii — U
G. pritzelli var pritzelli — I
G. viridiflorus — R
G. watermeyeri — R
Heliophila collina — R
Hesperantha latifolia — U
Homeria odorata — V
H. spiralis — R
H. vallisbelli — R
Ixia curvata — U
I. maculata var fusco-citrina — U
I. patens var patens — I
I. thomasiae — U
Lachenalia congesta — U
L. macgregori — U
L. schelpei — U
Lobostemon hottentoticus — V

Nemesia chrysolopha — R

Ornithogalum bicornutum — U

O. pilosum ssp *pullatum* — U

O. pruinatum — R

Othonna rechingeri — U

Oxalis calvinensis — U

O. lasiorrhiza — U

O. massoniana var *flavescens* — U

O. melanosticta var *latifolia* — U

O. pulvinata — U

O. rubro-punctata — U

Pentaschistis heterochaeta — U

Pherolobus maughani — R

Phylca agathosmoides — U

Polycarena filiformis — U

P. minimum — U

Priestleya schlechteri — U

Prionanthium rigidum — U

Romulea amoena — R

R. monadelpha — I

R. multisulcata — I

R. sanguinalis — R

R. viridibracteata — U

Rosenia angustifolia — U

R. glandulosa — U

Secale africanum — I

Sparaxis elegans — R

S. pillansii — I

S. tricolor — I

Staavia phyllicoides — I

Stapelia concinna var *paniculata* — R

S. thudichumii — R

S. villetae — I

Strumaria picta — U

S. watermeyeri — U

Sutera divaricata — U

S. esculenta — V

S. gracilis — U

S. stenopetala — U

Trichocaulon grande — U

Venidium fugax — U

Wahlenbergia minuta — U

Zaluzianskya nemesioides — U

Northern Bushmanland and Upper Karoo: Map 3 — 12

Adenium oleifolium — I

Adromischus diabolicus — I

A. humilis — R

Aloe karasbergensis — V

Arctotis diffusa — U

Caralluma arenicola — E

Crassula barbata ssp *broomii* — R

Cyrtanthus staadensis — V

Duvalia maculata — I

Felicia deserti — U

Gladiolus citrinus — E

Hoodia albispina — E

Huernia humilis — I

H. simplex — U

Lithops salicola — V

Ophthalmophyllum haramoepense — I

O. villetii — I

Ornithogalum bicornutum — U

O. deltoideum — U

O. zebrinum — U

Osteospermum armatum — U

Othonna lepidocaulis — U

Oxalis extensa — U

Polycarena gracilipes — U

Pteronia inflexa — U

Romulea membranacea — U

Schwantesia australis — I

S. pillansii — I

Stapelia macowanii — I

S. virescens — U

Trichocaulon keetmanshoopense — I

T. pillansii — E

T. rusticum — U

T. simile — U

Tridentea virescens — U

Venidium fugax — U

Sneeuberg Centre: Map 3 — 13

Brachymeris erubescens — U

Caralluma bredae var *thomallae* — I

Chasmatophyllum maninum — U

Cliffortia montana — U

Diascia tysoni — U

Euphorbia eustacei — U

Euryops dentatus — R

Faucaria candida — I

Gazania caespitosa — U

Gnaphalium simii — I

SOUTHERN MOUNTAIN REGION

Langeberg: Map 4 — L

- Acmadenia laxa* — V
A. niveni — R
Acrolophia lunata — R
Adenandra villosa ssp *apiculata* — R
Agathosma dielsiana — V
A. linifolia — U
A. subteretifolia — R
A. umbonata — R
Anisodonteia dissecta — V
Argyrobium connatum — R
Aspalathus campestris — U
A. hypnoides — U
A. longifolia — U
A. macrocarpa — U
A. spectabilis — R
A. truncata — U
A. vulpina — U

Bobartia macrospatha ssp *anceps* — R
B. parva — E
Brachymeris erubescens — U

Calopsis monostylis — I
Caralluma pillansii — I
Ceratocaryum fistulosum — I
Coleonema pulchrum — R
C. virgatum — R
Cyclopia bowieana — I
Cyrtanthus odoratus — V

Diosma passerinoides — V
D. tenella — R
Disa cardinalis — R
D. falcata — U
D. schlechteriana — R

Empleurum fragrans — R
Erica barrydalensis — U
E. chlorosepala — R
E. dysantha — I
E. granulatifolia — R
E. heleophila — U
E. heterophylla — U
E. lagenaeformis — I
E. latifolia — U
E. macilentata — U
E. mundii — U
E. nematophylla — R
E. obconica — U
E. oophylla — R
E. oxyandra — U
E. trichophora — U
Euchaetis avisylvana — R
E. longicornis — E

Ficinia quinquangularis — U
Freesia sparmannii — R

Gazania caespitosa — U
Geissoloma marginatum — R

Geissorhiza burchellii — U
Gibbaeum angulipes — U
Gladiolus bilineatus — E
G. emiliae — V
G. engysiphon — V
G. martleyi — U
G. punctulatus var *autumnalis* — R
G. stefaniae — R
Gnidia scabrata — U

Haworthia blackburniae — R
Helichrysum cochleariforme — U
Herschelianthe schlechterana — R
Heterolepis mitis — U
Hippia hirsuta — U

Ixia gloriosa — I
I. stolonifera — I

Laurentia longitubus — U
Leucadendron ericifolium — V
L. radiatum — R
L. tradouwense — E
Leucospermum formosum — V
L. mundii — R
L. winteri — R
Lightfootia effusa — U
L. pauciflora — U
L. planifolia — U
Lobelia dasyphylla — U
L. hypsibata — U
Lobostemon muirii — U

Mimetes splendidus — V
Monadenia macrostachya — E

Nivenia fruticosa — U

Osteospermum aciphyllum — V
Oxalis ciliaris var *pageae* — U

Pachites appressa — I
Phyllica brachycephala — U
P. longimontana — U
P. recurvifolia — U
Polycarena capitatum — I
Polygala langebergensis — I
Priestleya laevigata — R
Prismatocarpus hispidus — U
Psoralea macradenia — I
P. odoratissima — U

Raspalia barnardii — I
R. schlechteri — R
Roridula gorgonias — R
Ruschia amicorum — R

Senecio anthemifolius — U
S. rehmanni — U
Spatalla colorata — R

S. nubicola — R
Stilpnophytum inopinatum — U
S. ocephalum — U
Stylapterus dubius — R
S. ericifolius — R
Sutera subnuda — U

Tetraria robusta — U
Thamnea gracilis — I
Thamnochortus ellipticus — I

Vexatorella latebrosa — R

Wahlenbergia swellendamensis — U
Watsonia emiliae — U

Zeuktophyllum suppositum — U

Riviersonderend Mountains: Map 4 — RM

Adenandra gracilis — I
A. multiflora — I
A. villosa ssp *apiculata* — R
Agathosma leptospermoides — R
A. minuta — E
Anaxeton brevipes — R
A. hirsutum — R
Arctotis dregei — U
Aristea recisa — U
Aspalathus ferox — U
A. burchelliana — V
Athanasia hameri — U

Babiana foliosa — U

Cliffortia crenulata — U
C. intermedia — U
C. monophylla — U
C. multiformis — U
Cryptadenia laxa — U

Diosma eckloniana — U
D. thyrsochora — U
Disa bodkini — R
D. minor — R
Drimia minor — R

Endonema lateriflora — R
E. retzioides — V
Erica alfredii — R
E. caledonica — R
E. cryptanthera — U
E. diotaeflora — R
E. galgebergensis — R
E. insolitanthera — R
E. kraussiana — U
E. parvulisepala — R
E. praenitens — U
E. rufescens — U
E. trichophylla — U
E. xanthina — U
Evota venosa — E

Felicia annectens — X

Geissorhiza pappei — U
Gibbaeum esterhuyseniae — X
Gladiolus blommesteinii — I
G. brevitubus — R
G. emiliae — V
G. stokoei — E
G. subcaeruleus — U
Gnidia parviflora — U

Haworthia rubriflora — I
Heliophila tricuspidata — R
Homeria elegans — E

Lachenalia campanulata — I
Leucadendron burchellii — I
L. nervosum — R
Lobostemon gracilis — U
Lonchostoma esterhuyseniae — I

Metalasia bodkini — U
Monadenia pygmaea — U
Muraltia concava — I
M. ferox — I
M. pottebergensis — R

Nerine pudica — R
Nivenia dispar — U

Paranomus adiantifolius — R
P. capitatus — R
Passerina burchellii — R
Phylica apiculata — U
P. burchellii — U
P. lucens — U
Poellnitzia rubriflora — I
Priestleya capitata — R

Roridula gorgonias — R
Ruschia leipoldtii — E

Serruria incrassata — V
S. williamsii — R
S. zeyheri — R
Sorocephalus alopecurus — R
S. crassifolius — V
S. pinifolius — R
Spatalla argentea — R
S. colorata — R
S. propinqua — I
Staavia trichotoma — X
S. zeyheri — E

Thamnea depressa — X

Venidium angustifolium — U

Wahlenbergia serpentina — U
Watsonia caledonica — U

Outeniqua, Suuranys Mountains: Map 4 — O

Acmadenia rupicola — V
A. gracilis — V

A. maculata — E
Acrolophia lunata — R
A. ustulata — E
Agathosma martiana — R
A. planifolia — U
A. rehmanniana — U
Aspalathus digitifolia — U
A. fourcadei — U
Athanasia quinqueidentata — U

Bobartia robusta — R
Brachycorythis macowaniana — R

Carpobrotus fourcadei var *alba* — R
Cyrtanthus carneus — V

Diascia pentheri — U
Diosma passerinoides — V
Disa arida — V
D. bodkini — R
D. marlothii — R
D. salteri — R
Disparago rosea — U

Erica aneimena — U
E. beatricis — R
E. brachycentra — I
E. hirsuta — U
E. lehmannii — U
E. stylaris — U
E. zebrensis — U
E. zitzikammensis — U

Felicia tsitsikamae — R
Ficinia quinquangularis — U
Freesia corymbosa — U

Geissorhiza outeniquensis — R
Gladiolus leptosiphon — R
G. punctulatus var *autumnalis* — R
G. rogersii var *vlokii* — R
G. sempervirens — R
Gnidia parviflora — U

Herschelianthe spathulata ssp *tripartita* — R

Leucadendron ericifolium — V
L. olens — V
Leucospermum formosum — V
L. glabrum — R
L. hamatum — R
L. pluridens — R
L. secundifolium — R
Lobelia montaguensis — U

Mimetes splendidus — V
Monadenia macrostachya — E
Monopsis stricta — U

Osteospermum pterigoideum — U
Oxalis ioeides — U

Pachites bodkini — V
Paranomus longicaulus — V

Polycarena multifolia — U
Priestleya hirsuta — R
Prismatocarpus hispidus — U
Protea lanceolata — V
P. vogtsiae — I
Psoralea keetii — U

Relhania patersoniae — U
Romulea jugicola — R

Stilpnophytum ocephalum — U
Stoebe ensori — U

Tetraria robusta — U

Kouga Mountains: Map 4 — K

Acrolophia lunata — R
Agathosma spinosa — U
Aspalathus fourcadei — U

Euryops integrifolius — R

Leucadendron nobile — R
L. rourkei — R

Paranomus esterhuyseniae — R
Priestleya hirsuta — R
Protea vogtsiae — I

Relhania patersoniae — U

Sutera atrocaerulea — U

Widdringtonia schwarzi — V

Baviaanskloof Mountains: Map 4 — B

Agathosma uncarpellata — R
Atalaya capensis — R

Brunsvigia litoralis — E

Cyrtanthus staadensis — V

Erica abelii — V
E. ostiaria — R
E. valida — R
Euryops ursinoides — I

Gladiolus robustus — R

Herschelianthe lugens var *lugens* — V

Indigofera hispida — U

Lachnea glomerata — I
Leucadendron orientale — I
L. rourkei — R

Othonna membranifolia — I

Paranomus esterhuyseniae — R
P. reflexus — R
Priestleya hirsuta — R
P. tecta — R

Relhania patersoniae — U

Senecio serrurioides — U
Staavia glutinosa — R

Watsonia ecklonii — I
Widdringtonia schwarzii — V

**Swartberg, Rooiberg and Kammanassie
Mountains: Map 4 — SW**

Acmadenia baileyensis — V
A. maculata — E
Agathosma affinis — R
A. zwartbergense — R
Argyrobium crinatum — U
Aspalathus incana — U
A. karrooensis — U
A. oliveri — R
A. ramosissima — U

Berkheya francisci — R
Blepharis inermis — U
Bobartia paniculata — R

Caralluma linearis — R
C. pillansii — I
Cliffortia aculeata — U
C. cymbifolia — U
C. montana — U
Crassula brachystachya — U
C. rupestris var marnierana — U
Cyclopia burtonii — I

Diascia ramosa — U
Diosma passerinoides — R
D. thysophora — U
Disa arida — V
D. salteri — R
Disparago rosea — U

Elegia altigena — U
Erica blesbergensis — R
E. gossypioides — I
E. heleophila — U
E. inamoena — U
E. inordinata — R
E. insignis — R
E. ostiaria — R
E. toringbergensis — R
E. trachysantha — U
E. umbonata — U
E. valida — R
E. zebrensis — U
E. zwartbergense — U
Euphorbia multifolia — U

Felicia esterhuyseniae — R

Geissorhiza elsiae — R
G. nigromontana — R
Gladiolus leptosiphon — R
G. lewisiae — E
G. nigromontanus — V

Haworthia blackburniae — R
H. truncata — I
Heliophila rimicola — R
Hermannia pillansii — I
Herschelianthe lugens var lugens — V
Hoodia barklyi — I

Ixia leipoldtii — U

Lachnostylis bilocularis — V
Leucadendron rourkei — R
L. singulare — R
L. sorocephaloides — V
Leucospermum pluridens — R
L. secundifolium — R

Muraltia carnosa — U
M. karroica — I

Nerine peersii — U

Otholobium rubicundum — U
Oxalis dichotoma — U
O. fourcadei — U
O. ioeides — U

Paranomus centaureoides — R
P. esterhuyseniae — R
P. roodebergensis — R
Phyllica nigromontana — U
P. sericea — U
Podalyria tayloriana — V
Protea pruinosa — R
Psoralea macradenia — I

Restio papyraceus — R
Romulea jugicola — R
R. vlokii — R

Staberoha stokoei — R
Stapelianthus choananthus — I

Tanquana hilmari — V
Tridentea choananthus — I
Tylecodon heterophylla — R

Watsonia emiliae — U

Witteberg Renosterveld: Map 4 — W

Acmadenia argillophila — V
Aspalathus lamarckiana — U

Caralluma linearis — R
C. pillansii — I
Crassula brachystachya — U

- Diosma passerinoides* — R
Erica insignis — R
Geissorhiza rogersii — U
Hermannia pillansii — I
Hypodiscus sulcatus — R
Ixia trifolia — U
Leucadendron cadens — R
Lobostemon gracilis — U
L. horridus — U
Othonna linearifolia — U
O. pinnatiflobata — U
O. spinescens — U
Phylica wittebergensis — U
Phymaspermum schroeteri — R
Priestleya tomentosa — R
Protea convexa — R
Romulea sphaerocarpa — I
Senecio succulentus — U
Strumaria pubescens — R
Trichocaulon pillansii — E
Mixed Renosterveld 1: Map 4 — MR1
Agathosma spinosa — U
Glottiphyllum uniondalense — U
Herschelianthe spathulata ssp *tripartita* — U
Lachnostylis bilocularis — V
Pleispilos kingiae — U
P. leipoldtii — I
Senecio diodon — U
Trichodiadema densum — R
Mixed Renosterveld 2: Map 4 — MR2
Agathosma uncarpellata — R
Encephalartos caffer — V
E. longifolius — V
Cyrtanthus loddigesianus — R
Dierama pulcherrimum — V
Freesia corymbosa — U
Gasteria armstrongii — U
Gazania caespitosa — U
Gladiolus guenzii — I
Kniphofia citrina — I
Lachnaea glomerata — I
Othonna membranifolia — I
Rapanea gilliana — V
**South East Coast Renosterveld:
Map 4 — R1**
Atalaya capensis — R
Bobartia macrocarpa — U
Brunsvigia litoralis — E
Crinum lineare — R
Cyclopia pubescens — U
Cyrtanthus clavatus — R
C. helictus — R
C. loddigesianus — R
C. spiralis — V
C. staadensis — V
Encephalartos horridus — V
E. lehmannii — R
E. longifolius — V
Erica ethelae — U
Eulophia platypetala — V
Gladiolus alatus var *algoensis* — X
Herschelianthe lugens var *lugens* — V
Holothrix pilosa — I
Kniphofia citrina — I
Lampranthus algoensis — R
L. dunensis — I
Lessertia kensitii — U
Marsilea schelpeana — V
Nerine huttoniae — U
Oldenburgia arbuscula — R
Priestleya hirsuta — R
Rapanea gilliana — V
Sterculia alexandri — R
Strelitzia juncea — R
Syringodea flanaganii — U
Suurberg Grassy Fynbos: Map 4 — GF1
Atalaya capensis — R
Crassula arborescens ssp *undulatifolia* — R
Heterolepis mitis — U

Ornithogalum anguinum — R

Stapelia conformis — R
S. longii — I

Tridentea longii — I

Humansdorp Fynbos: Map 4 — GF2

Agathosma uncarpellata — R

Brachycorythis macowaniana — R

Cyrtanthus loddigesianus — R
C. staadensis — V

Dierama pulcherrimum — V

Encephalartos caffer — V
E. longifolius — V
Eriocephalus tenuipes — U

Freesia corymbosa — U

Gasteria armstrongii — U
Gladiolus guenzii — I

Herschelianthe lugens var *nigrescens* — I
H. spathulata ssp *tripartita* — R
Holothrix pilosa — I
Huernia longii — I

Kniphofia citrina — I
Kobresia ecklonii — U

Lachenalia haarlemensis — I
Leucadendron nobile — R
Lotononis viborgioides — R

Mimetes splendidus — V

Osteospermum pterigoideum — U
Othonna membranifolia — I
Oxalis heidelbergensis — U

Paranomus reflexus — R
Priestleya hirsuta — R

Rapanea gilliana — V

Stoebe ensori — U
Sutera atrocaerulea — U

Watsonia ecklonii — I

Southern Coastal Slopes: Map 4 — AM

Acmadenia alternifolia — R
Acrolophia lunata — R
Agathosma planifolia — R
Aristea simplex — U
Aspalathus bowieana — U

Erica keetii — U

Faurea macnaughtonii — U

Helichrysum ramulosum — U
Herschelianthe forcipata — U
H. newdigatae — V

Indigofera hispida — U

Leucospermum formosum — V
L. glabrum — R

Mimetes splendidus — V
Monadenia physodes — I

Oxalis duriuscula — U

Priestleya hirsuta — R
Psoralea keetii — U
Pterygodium newdigatae var *cleistogamum* — R
P. newdigatae var *newdigatae* — I

Satyrium muticum — V
Strelitzia alba — I

Dune Fynbos: Map 4 — DF

Agathosma alaris — U
A. dielsiana — U

Cyphia tortilis — U

Satyrium muticum — V

Kafrarian Thicket: Map 4 — KT

Brunsvigia litoralis — E

Cyrtanthus spiralis — V

Herschelianthe lugens var *nigrescens* — I

Valley Bushveld Zone: Map 4 — VB

Amphiglossa callunoides — U
Atalaya capensis — R
Athanasia mundtii — U

Brunsvigia litoralis — E
Bulbine flexicaulis — U

Crassula arborescens ssp *undulatifolia* — R
C. socialis — R
Crinum lineare — R
Cyclopia filiformis — U
C. longifolia — U
C. pubescens — U
Cyrtanthus clavatus — R
C. helictus — R
C. loddigesianus — R
C. spiralis — V

Encephalartos horridus — V
E. lehmannii — R
E. longifolius — V
Euryops latifolius — R

Freesia corymbosa — U

Helichrysum recurvatum — V
Heliophila ramosissima — U

Kniphofia citrina — I

Lachenalia haarlemensis — I
Lampranthus algoensis — R
Lessertia carnosa — U
Lobelia zwartkopensis — V

Marsilea schelpeana — V

Neopatersonia uitenhagensis — U
Nerine huttoniae — U

Oldenburgia arbuscula — R
Othonna membranifolia — I

Pentaschistis zeyheri — U
Psoralea patersoniae — U

Rapanea gilliana — V

Senecio addoensis — U
S. hirtellus — U
S. microspermus — U
Stapelia plantii — R
Sterculia alexandri — R
Strelitzia juncea — R
Sutera infundibuliformis — U
S. intertexta — U
Syringodea flanaganii — U

Trichodiadema rupicolum — I

SOUTHERN COASTAL LOWLAND REGION

Strandveld 1: Map 5 — S1

Aspalathus excelsa — R
A. rosea — R

Erica oligantha — I
Eulophia litoralis — I

Gladiolus pillansii var *roseus* — R

Homoglossum guthriei — R

Lampranthus dunensis — I
Leucadendron elimense ssp *elimense* — E
L. modestum — V
Liparia splendens — U

Monadenia macrostachya — E

Phylica lucida — U
Pteronia tenuifolia — U

Spatalla ericoides — V
Stapelia divaricata — V

Strandveld 2: Map 5 — S2

Acrolophia bolusii — V
Agathosma abrupta — I
Amphiglossa callunoides — U
Aristea palustris — U
Aspalathus aciloba — U
Athanasia mundtii — U

Calopsis rigoratus var *simulans* — V
Caryotophora skiatophytoides — R
Chondropetalum rectum — V

Diosma arenicola — U
D. haelkraalensis — R
D. tenella — R

Elegia prominens — V
E. verreauxii — V
Erica riparia — I
Euchaetis diosmoides — U

Gladiolus debilis var *variegatus* — R
G. guthriei — V

Hermannia trifoliata — I

Ischyrolepis sabulosus — E

Lampranthus arbutnotiae — U
Leucadendron elimense ssp *elimense* — E

Moraea barnardii — V
Muraltia calycina — V

Osteospermum hafstroemii — R

Phylica amoena — U
Priestleya guthriei — U
Pteronia tenuifolia — U

Restio dodii var *purpureus* — E

Spatalla ericoides — V
Staberoha multispicula — I
Stoebe cyathuloides — U
S. salteri — V

Thamnochortus dumosus — V
T. pellucidus — V
T. pluristachyus — V

Strandveld 3: Map 5 — S3

Adenandra rotundifolia — R
Agathosa minuta — E
Aspalathus obtusifolia — U
A. prostrata — E

Cyrtanthus carneus — V

Diosma arenicola — U
D. passerinoides — V
Dymondia margaretae — R

Erica uysii — R

Hermannia concinnifolia — I
H. trifoliata — I

Leucadendron modestum — V
Leucospermum fulgens — V
Limonium kraussianum — R
Lobelia valida — I
Lobostemon collinus — U

Muraltia calycina — V

Polygala pottebergensis — I
Protea aurea ssp *pottebergensis* — V
P. denticulata — R

Restio dodii var *purpureus* — E

Stoebe muirii — I
Sutera infundibuliformis — U

Trichodiadema pygmaeum — I

Dune Fynbos 1: Map 5 — DF1

Aspalathus arenaria — R

Euryops muirii — E

Gladiolus maculatus ssp *hiburnus* — U
Leucospermum muirii — R
L. praecox — I
Relhania steyniae — E
Stapeliopsis saxatilis var *stayneri* — R
Stoebe muirii — I
Thamnochortus muirii — V

Dune Fynbos 2: Map 5 — DF2

Aspalathus arenaria — R
A. obtusifolia — U
Cyphia dentariaefolia — U
Euphorbia pseudoglobosa — U
Metalasia erectifolia — R
Leucospermum praecox — I
Satyrium muticum — V

Limestone Fynbos 1: Map 5 — LF1

Adenandra rotundifolia — R
Adenocline stricta — R
Agathosma dielsiana — R
A. affinis — R
Aspalathus aciloba — U
A. barbiger — E
A. smithii — R
Brachysiphon mundii — R
Delosperma mariae — U
Diosma haelkraalensis — R
Erica occulta — R
E. uysii — R
Euchaetis intonsa — R
Felicia ebracteata — U
Gladiolus floribundus ssp *miniata* — I
Hermannia concinnifolia — I
H. trifoliata — I
Homoglossum vandermerwei — E
Ischyrolepis sabulosus — E
Leucospermum fulgens — V
Limonium kraussianum — R
Lobelia valida — I
Metalasia erectifolia — R
Muraltia pottebergensis — R

Nerine breachiae — U
Paranomus abrotanifolius — R
Phyllica laevigata — U
P. lucida — U
Stapeliopsis saxatilis var *stayneri* — R
Stoebe muirii — I
Thamnochortus muirii — V
T. pluristachyus — V

Limestone Fynbos 2: Map 5 — LF2

Agathosma pallens — I
Aspalathus aciloba — U
A. obtusifolia — U
A. spectabilis — R
Bobartia robusta — R
Diosma tenella — R
Euphorbia corymbosa — U
Euryops muirii — E
Helichrysum cochleariforme — U
Hermannia concinifolia — I
Leucospermum muirii — R
L. praecox — I
Paranomus abrotanifolius — R
Satyrium muticum — V
Senecio microspermus — U
Wahlenbergia tumida — U

**Soetanysberg Limestone Fynbos 3:
Map 5 — LF3**

Adenandra odoratissima ssp *odoratissima* — R
Calopsis impolitus — V
Diosma arenicola — U
D. tenella — R
Elegia fenestrata — V
Erica aghillana — V
Leucadendron elimense ssp *elimense* — E
L. platyspermum — V
L. stelligerum — V
Protea angustata — V
Thamnochortus dumosus — V
T. fraternus — R
T. guthrieae — R
T. pluristachyus — V

Elim Dwarf Fynbos: Map 5 — CF+E

Adenandra schlechteri — I
Agathosma abrupta — I
A. minuta — E
Anisodontea dissecta — V
Aristea palustris — U
Aspalathus aciloba — U
A. burchelliana — V
A. excelsa — R
A. globulosa — I
A. macrantha — I
A. prostrata — E

Chondropetalum rectum — V
Cliffortia curvifolia — U
Corycium excisum — R
Cyrtanthus carneus — V

Diosma arenicola — U
D. haelkraalensis — R
D. parvula — E
D. tenella — R
Dymondia margaretae — R

Erica berzeloides — U
E. casta — V
Euchaetis diosmoides — U

Freesia elimense — R

Gladiolus floribundus ssp *miniatus* — I
G. guthriei — V
G. subcaeruleus — U

Hermannia concinnifolia — I
H. trifoliata — I
Homoglossum guthriei — R

Ischyrolepis sabulosus — E
Ixia patens var *patens* — I

Leucadendron elimense ssp *elimense* — E
L. modestum — V
L. platyspermum — V
L. stelligerum — V
Lightfootia squarrosa — U
Limonium kraussianum — R
Lobelia capillipes — U
Lobostemon collinus — U
L. grandiflorus — R
L. inconspicuus — U
L. lucidus — U

Macrostylis cauliflora — V
Muraltia cuspidata — I
M. gillettiae — U
M. spicata — U

Pachites bodkini — V
Paranomus abrotanifolius — R
Phylica incurvata — U
P. laevifolia — U
P. parvula — V

Polygala dasyphylla — I
Priestleya tecta — R
Protea pudens — V
Pteronia scabra — U
P. tenuifolia — U

Relhania spathulifolia — R
Restio festucaeformis — V
R. harveyi — E
Roella cuspidata var *hispida* — U

Spiloxene declinata — I
Spatalla ericoides — V
Staberoha multispicula — I
Stoebe copholepis — U
S. salteri — V

Thamnochortus dumosus — V
T. pellucidus — V
T. pluristachyus — V

Watsonia caledonica — U

Coastal Renosterveld: Map 5 — R

Acmadenia laxa — V
Adenandra multiflora — I
A. villosa var *robusta* — R
Agathosma dielsiana — V
A. eriantha — V
A. gnidiiflora — I
A. linifolia — U
A. pallens — I
Apodilirion lanceolatum — R
Arctotheca forbesiana — I
Arctotis dregei — U
Argyrolobium aciculare — U
A. brevicalyx — E
Aspalathus burchelliana — V
A. excelsa — R
A. grobleri — E
A. odontoloba — U
A. quadrata — U
A. rosea — R
A. smithii — R
Athanasia mundtii — U

Babiana foliosa — U
Berzelia ecklonii — R
Bobartia longicyma ssp *longicyma* — U
Brachysiphon rupestris — R

Charadrophila capensis — V
Chondropetalum rectum — V
Cliffortia crenulata — U
C. monophylla — U
C. multiformis — U
Cryptocaria angustifolia — U
Cyclopia bowiciana — I
Cyrtanthus odoratus — V

Diosma passerinoides — V
D. thysophora — U

- Disa brachyceras* — U
D. hallackii — E
D. tenuis — R
Dymondia margaretae — R

Elegia prominens — V
Erica dulcis — R
E. hendricksei — R
E. jasminiflora — X
E. lowryensis — R
E. octonaria — U
E. parvulisepala — R
E. pillansii — V
E. praenitens — U
E. pyrantha — U
E. xanthina — U
Eriospermum stoloniferum — U
Euchaetis linearis — U
E. schlechteri — R
Eulophia litoralis — I
Euphorbia corymbosa — U
E. pseudoglobosa — U

Felicia annectens — X
Freesia sparmannii — R

Geissorhiza geminata — U
G. pappei — U
Gibbaeum esterhuyseniae — X
Gladiolus acuminatus — E
G. bilineatus — E
G. brevitubus — R
G. emiliae — E
G. engysiphon — V
G. floribundus ssp *miniatus* — I
G. involutus — I
G. maculatus ssp *hibernus* — U
G. stokoei — E
G. subcaeruleus — U
G. tristis var *concolor* — U
Grisebachia niveni — I

Haemanthus canaliculatus — V
Haworthia marginata — I
Hermannia concinnifolia — I
H. trifoliata — I
Holothrix pilosa — I
Homeria comptonii — V
H. elegans — E
Homoglossum vandermerwei — E
Hypodiscus alternans — R

Indigofera superba — R

Klattia partita — R

Lampranthus dunensis — I
Lachnaea eriocephala — R
Leucadendron coriaceum — R
L. elimense ssp *salteri* — V
L. ericifolium — V
L. modestum — V
L. platyspermum — V
Leucospermum muirii — R

L. praecox — I
L. winteri — R
Lightfootia microphylla — U
L. multiflora — U
Lotononis viborgioides — R

Mimetes splendidus — R
M. stokoei — X
Monadenia macrostachya — E
Moraea debilis — V

Nerine breachiae — U
Nivenia dispar — U
N. levynsiae — I
N. stokoei — R

Oedera muirii — U
Oxalis duriuscula — U
O. heidelbergensis — U

Pachites bodkini — V
Phylica diosmoides — U
P. laevis — U
Priestleya capitata — R
P. glauca — I
P. tomentosa — R
P. vestita — U
Prismatocarpus cordifolius — R
Protea angustata — V
Pteronia tenuifolia — U

Restio festucaeformis — V
Roridula gorgonias — R
Ruschia leipoldtii — E

Satyrium muticum — V
Selaginella pygmaea — U
Senecio anthemifolius — U
S. trachyphyllus — U
Serruria meisneriana — R
Sonderothamnus petraeus — R
S. speciosus — R
Sorocephalus alopecurus — R
Sparaxis fragrans — V
Spatalla colorata — R
S. prolifera — E
S. propinqua — I
Stapelia divaricata — V
Stilpnophytum ocephalum — U
Stoebe copholepis — U
S. humilis — R
S. salteri — V
Sutera cephalotes var *cephalotes* — U

Thesium bathyschistum — U
T. fallax — U
Thaminophyllum latifolium — R
T. mundii — R
Thamnochortus muirii — V
T. pellucidus — V
T. pluristachyus — V
Tritoniopsis flexuosa — V

Venidium angustifolium — U

Watsonia caledonica — U

Mixed Renosterveld and Fynbos: Map 5 — R/F

Agathosma dielsiana — V

Anisodontea alexandri — E

Aspalathus bowieana — U

A. burchelliana — V

A. campestris — U

A. obtusifolia — U

Bobartia robusta — R

Cyclopia bowieana — I

Diosma aristata — E

D. passerinoides — V

Empleurum fragrans — V

Erica pearsoniana — U

Geissorhiza burchellii — U

Gladiolus emiliae — E

G. guenzii — I

G. punctulatus var autumnalis — R

Haworthia marginata — I

Hermannia concinnifolia — I

Herschelianthe schlechteriana — R

Heterolepis mitis — U

Liparia splendens — U

Lobelia dichroma — U

Monadenia macrostachya — E

Mimetes splendidus — R

Oxalis stellata var gracilior — U

Pentaschistis burchellii — U

Protea lanceolata — V

Satyrium muticum — V

Stoebe salteri — V

Thamnochortus muirii — V

Wahlenbergia ciliolata — U

Mountain Fynbos 1: Map 5 — MF1

Acrostemon xeranthemifolius — I

Aspalathus rosea — R

Audouinia capitata — V

Brachysiphon rupestris — R

Cliffortia crenulata — U

C. geniculata — I

Corycium rubiginosum — R

Cyrtanthus carneus — V

C. guthrieae — V

Diosma parvula — E

Disa brachyceras — U

Erica hendricksei — R

E. patersoniae — R

E. shannonea — R

E. trichophora — U

E. turrisbabylonica — U

E. ustulescens — I

Euchaetis diosmoides — U

E. schlechteri — R

Euryops lasiocladus — I

Evota venosa — E

Galaxia barnardii — U

Gladiolus acuminatus — E

G. carmineus — R

Lachenalia sargeantii — U

Leucadendron cryptocephalum — V

L. elimense ssp salteri — V

Lobelia disperma — U

L. laurentioides — U

Mairea decumbens — U

Mimetes capitulatus — R

M. hirtus — V

M. palustris — R

M. stokoei — X

Monadenia macrostachya — E

M. pygmaea — U

Moraea barnardii — V

M. cooperi — V

Muraltia hirsuta — I

Nivenia stokoei — R

Oxalis duriuscula — U

Pseudobaeckea stokoei — R

Restio festucaeformis — V

Roella cuspidata var hispida — U

Roridula gorgonias — R

Serruria meisneriana — R

Sonderothamnus speciosus — R

Sutera cephalotes var cephalotes — U

S. cephalotes var glabrata — U

Thaminophyllum multiflorum — U

T. latifolium — R

Thamnochortus dumosus — V

Thesium bathyschistum — U

Witsenia maura — R

Mountain Fynbos 2: Map 5 — MF2

Acrolophia bolusii — V

Agathosma sp nov (P.A. Bean 480) — R

Aristea palustris — U

Berkheya angusta — U

Cliffortia monophylla — U

Cyrtanthus guthrieae — V

Erica casta — V

E. oligantha — I

E. pauciovulata — R

E. shannonea — R

Gladiolus acuminatus — E

G. debilis var variegatus — R

Harveya euryantha — U

Homeria comptonii — V

H. elegans — E

Ixia bellendenii — U

Leucadendron elimense ssp elimense — E

L. platyspermum — V

L. stelligerum — V

Lobostemon bolusii — E

L. grandiflorus — R

L. lucidus — U

Macrostylis cauliflora — V

Muraltia gillettiae — U

M. spicata — U

Phylica floribunda — U

Polygala dasyphylla — I

Priestleya tecta — R

Rhigiophyllum squarrosum — U

Spiloxene declinata — I

Staberoha multispicula — I

Stoebe humilis — R

Thesium fallax — U

Wahlenbergia bolusiana — U

Mountain Fynbos 3: Map 5 — MF3

Acmadenia rotundifolia — R

Anisodontea dissecta — V

Aspalathus barbigerata — E

A. burchelliana — V

Cyrtanthus carneus — V

Diosma passerinoides — V

D. tenella — R

Dymondia margaretae — R

Erica casta — V

Euchaetis diosmoides — U

E. intonsa — R

E. schlechteri — R

Felicia ebracteata — U

Gladiolus carmineus — R

G. guthriei — V

G. tristis var concolor — U

Hermannia concinnifolia — I

H. rudis — I

H. trifoliata — I

Leucadendron coriaceum — R

L. cryptocephalum — V

Leucospermum fulgens — V

Lobostemon grandiflorus — R

Moraea elsiae — R

Muraltia pottebergensis — R

Osteospermum elsiae — R

Otholobium pungens — R

Phylica brevifolia — R

P. lasiantha — U

Polycarena multifolia — U

Protea aurea ssp potbergensis — V

P. denticulata — R

Rhigiophyllum squarrosum — U

R. rhodantha — R

Stapeliopsis saxatilis var stayneri — R

Stoebe cyathuloides — U

Mountain Fynbos 4: Map 5 — MF4

Agathosma orbicularis — X

Anaxeton hirsutum — R

Aristea biflora — E

Aspalathus smithii — R

Bobartia longicyma ssp longicyma — U

Corycium bifidum — I

Cullumia selago — U

Diosma passerinoides — V

Endonema retzioides — R

Erica pillansii — V

E. pyrantha — U

Euchaetis linearis — U

Felicia nigrescens — U

Galaxia barnardii — U

Gladiolus acuminatus — E

G. blommesteinii — I

G. floribundus ssp miniatus — I

G. tristis var concolor — U

Heliophila tricuspida — R

Homeria comptonii — V

H. elegans — E

Liparia splendens — U

Metalasia bodkinii — U
Moraea cooperi — V
M. insolens — E

Osteospermum aciphyllum — V
Oxalis duriuscula — U

Pachites bodkini — V
Pelargonium caledonicum — R
Phylica anomala — U
P. apiculata — U
P. brevifolia — R
P. laevis — U
Priestleya elliptica — E

Restio festucaeformis — V
R. scaber — V
Roella bryoides — U
R. lightfootioides — U
Roridula gorgonias — R

Sonderothamnus speciosus — R
Spatalla colorata — R

Thaminophyllum mundii — R
Thamnohortus guthrieae — R
Tritoniopsis elongata — I

Watsonia caledonica — U

Valley Bushveld 1: Map 5 — VB1

Diosma passerinoides — R

Limonium kraussianum — R

Nestlera tenuifolia — U

Valley Bushveld 4: Map 5 — VB4

Aspalathus campestris — U

Gladiolus maculatus ssp *hiburnus* — U

Senecio muirii — U

Valley Bushveld 5: Map 5 — VB5

Bobartia robusta — R

Stapelia bijliae — U

Wahlenbergia ciliolata — U

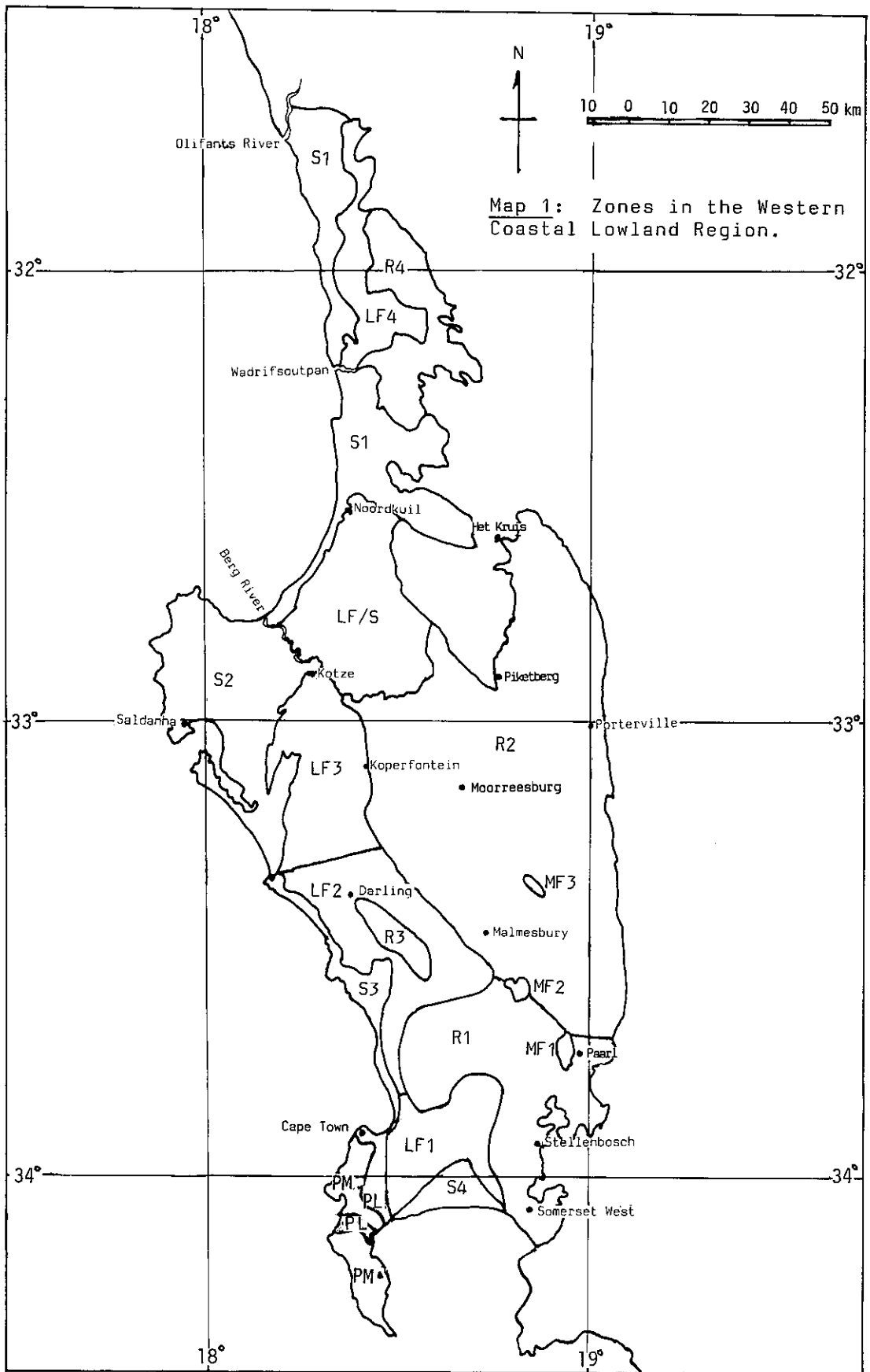
APPENDIX 3: STATISTICS AND MAPS

Statistics are given below for the numbers of threatened plants in each of the regions described in Appendix 2. The boundaries of the regions are illustrated on maps which have been based on physiography together with vegetation data from Moll et al. (1984), Boucher (1983) and Hilton-Taylor (in prep.). It should be noted that the areas extend over most of, but not all, the Karoo and Fynbos Biomes. It must be emphasized that the statistical data are preliminary. The reasons for this are given in Appendix 1.

The categories of the threatened plants are abbreviated as: U - Uncertain; I - Indeterminate; R - Critically Rare; V - Vulnerable and Declining; E - Endangered; X - Extinct. The average density of threatened plants in each region is given by a species/area ratio, scaled up for clarity by a factor of 1 000.

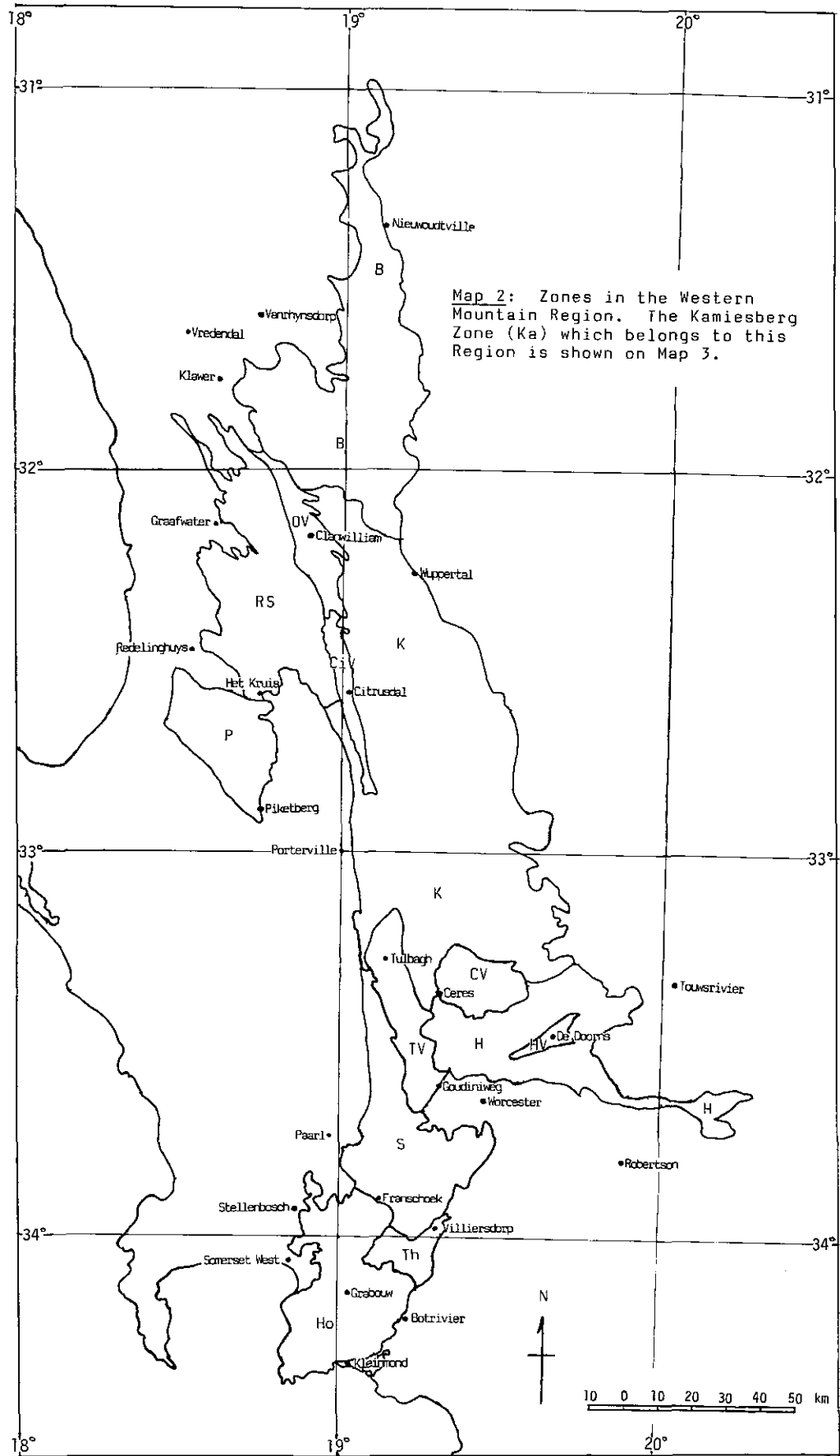
REGIONAL DISTRIBUTION OF THREATENED PLANTS

REGION	U	I	R	V	E	X	TOTAL	AREA (km ²)	SPP/AREA (x1000)
Cape Province W. of 26° E. and S. of the Orange River	702	281	495	183	118	29	1 808	437 143	4
Fynbos biome (major part)	472	184	389	152	103	26	1 326	77 393	17
Karoo biome (major part)	261	104	115	36	20	3	539	359 750	1
W. Coastal Lowland Region	91	77	83	69	58	8	385	14 700	26
Western Mountain Region	262	80	202	53	36	11	644	17 223	37
Southern Mountain Region	178	56	142	45	16	5	442	31 230	14
S. Coastal Lowland Region	118	43	91	57	30	5	344	14 240	24



WESTERN COASTAL LOWLAND REGION — MAP 1

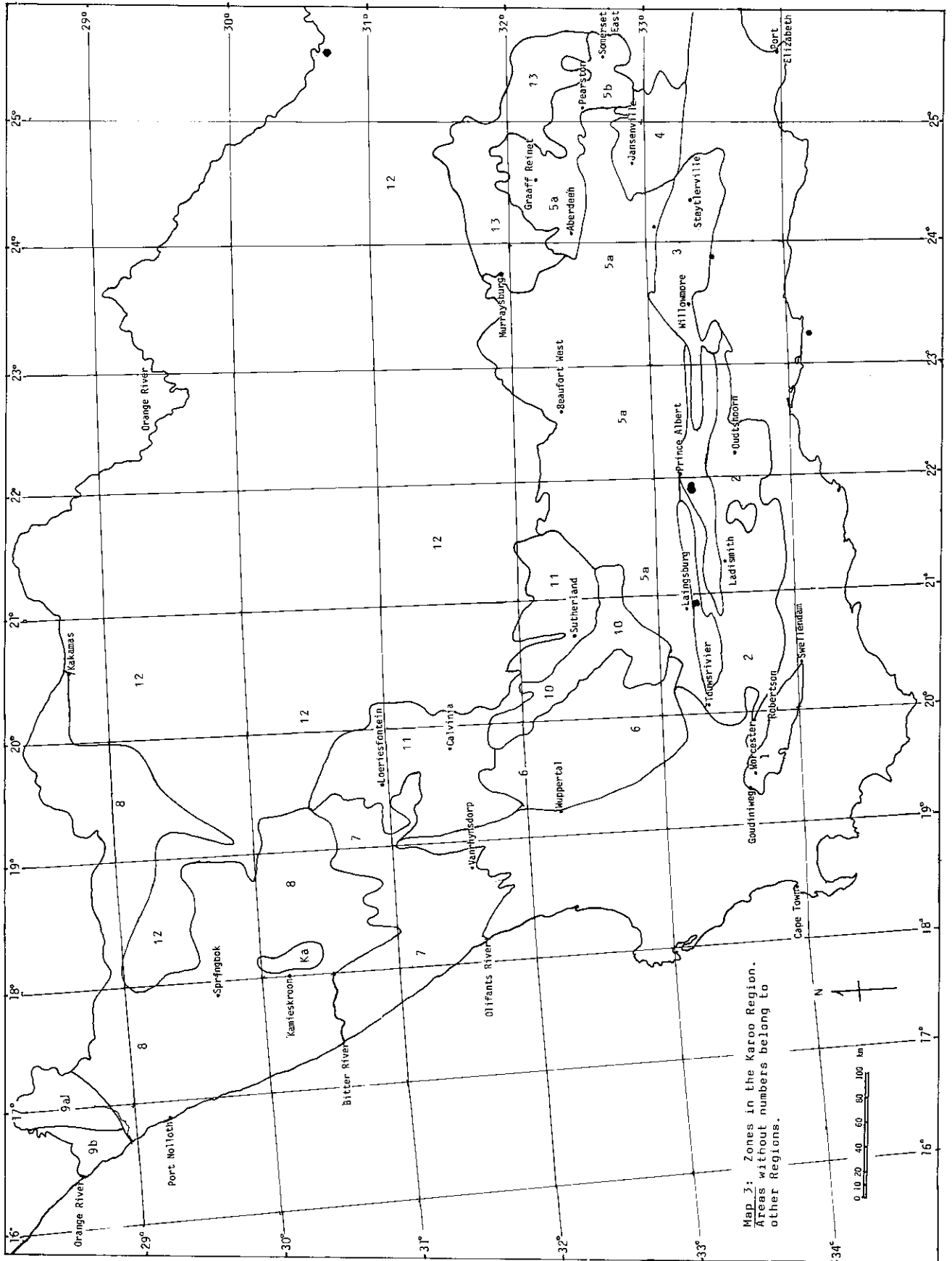
BIOGEOGRAPHIC ZONE	U	I	R	V	E	X	TOTAL	AREA (km ²)	SPP/AREA (x1000)
Peninsula Mountains — PM	22	18	49	18	19	1	127	300	423
Peninsula Lowlands — PL	9	25	8	13	15	4	74	160	462
Strandveld 1 — S1	17	3	6	3	1	0	30	1 290	23
Strandveld 2 — S2	2	11	5	9	3	1	31	1 320	23
Strandveld 3 — S3	0	8	4	14	6	1	33	240	138
Strandveld 4 — S4	4	3	2	9	7	0	25	150	166
Sand Plain Fynbos 1 — LF1	4	15	8	16	17	2	62	540	115
Sand Plain Fynbos 2 — LF2	5	10	10	25	15	1	66	930	71
Sand Plain Fynbos 3 — LF3	7	6	5	8	2	2	30	850	35
Sand Plain Fynbos 4 — LF4	1	0	1	0	0	0	2	470	4
Mosaic of Sand Plain Fynbos and Western Strandveld — LF/S	5	1	0	0	0	0	6	1 110	5
Coastal Renosterveld 1 — R1	16	23	14	19	18	3	93	1 580	59
Coastal Renosterveld 2 — R2	19	12	14	28	19	0	92	4 900	19
Coastal Renosterveld 3 — R3	6	8	5	16	5	1	41	140	293
Coastal Renosterveld 4 — R4	2	0	1	1	0	0	4	660	6
Mountain Fynbos 1 — MF1	2	2	1	1	0	0	6	30	200
Mountain Fynbos 2 — MF2	0	1	2	4	1	0	8	20	400
Mountain Fynbos 3 — MF3	3	0	0	2	1	0	6	10	600



Map 2: Zones in the Western Mountain Region. The Kamiesberg Zone (Ka) which belongs to this Region is shown on Map 3.

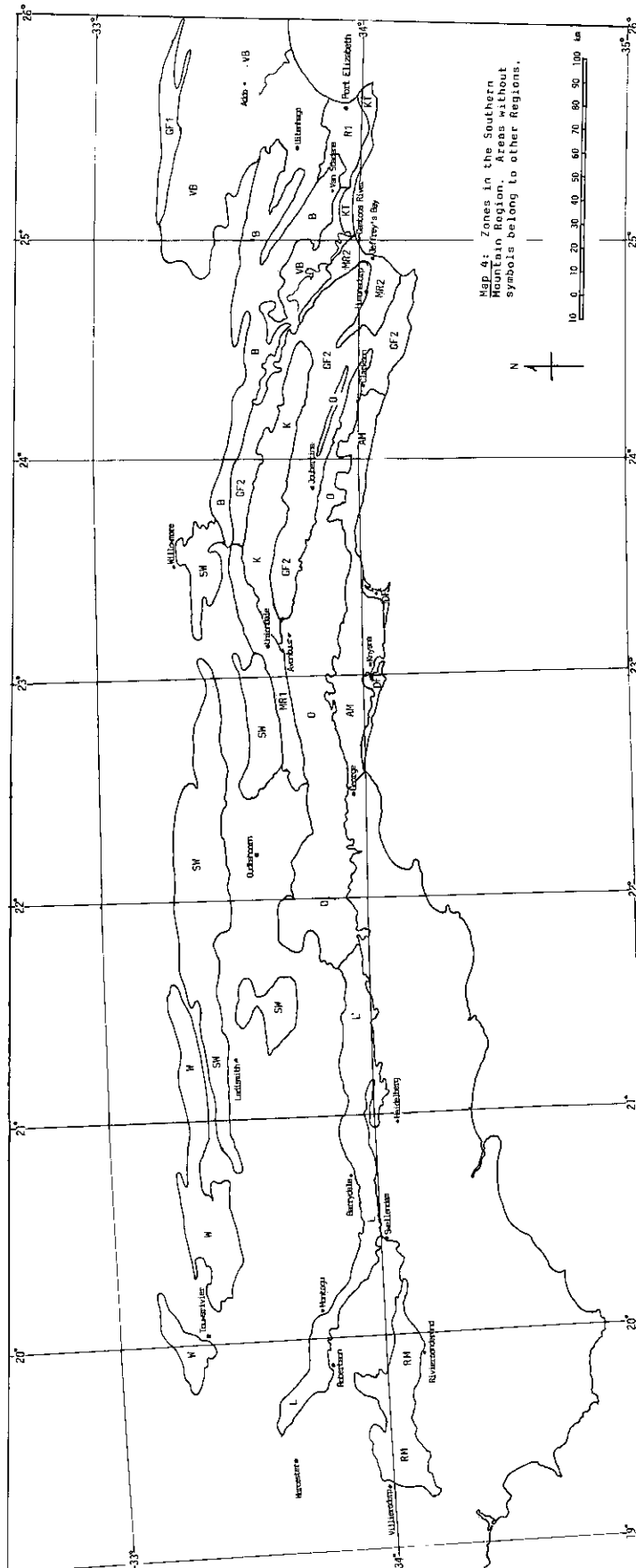
WESTERN MOUNTAIN REGION — MAP 2

BIOGEOGRAPHIC ZONE	U	I	R	V	E	X	TOTAL	AREA (km ²)	SPP/AREA (x1000)
Piketberg — P	13	5	12	2	5	0	37	740	50
Kouebokkeveld, Cedarberg, Olifantsrivier Mts. — K	96	19	77	11	9	4	216	5 180	42
Citrusdal Valley — CiV	6	7	4	0	0	0	17	180	94
Tulbagh Valley — TV	7	5	4	6	4	1	27	570	47
Ceres Valley — CV	8	1	3	2	0	0	14	350	40
Hexrivier Mountains — H	15	2	22	3	3	0	45	1 580	28
Hexrivier Valley — HV	10	2	1	2	0	0	15	80	188
Slanghoek Mountains — S	35	9	30	13	10	2	99	1 200	83
Hottentots-Holland Mts. — Ho	53	21	52	23	9	5	163	1 370	119
Theewaterskloof — Th	5	2	2	4	1	0	14	230	61
Redelinghuys Swartberg — RS	12	2	8	0	2	0	24	1 750	14
Clanwilliam Valley — OV	16	9	6	1	0	0	22	403	55
Bokkeveld Mountains — B	42	11	26	5	1	0	85	2 770	31
Kamiesberg — Ka (Map 3)	20	4	8	0	2	0	34	820	41



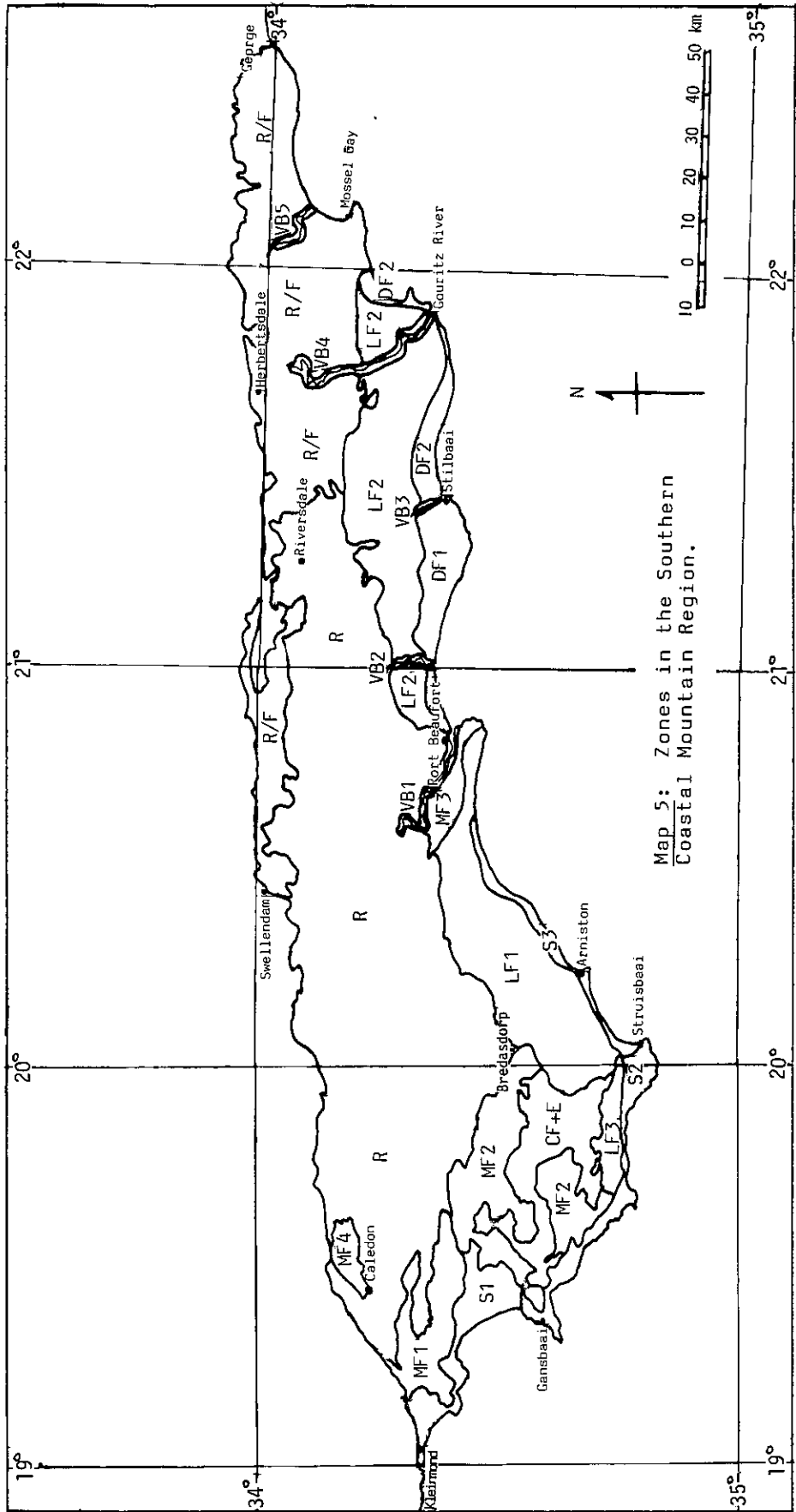
KAROO REGION — MAP 3

BIOGEOGRAPHIC ZONE	U	I	R	V	E	X	TOTAL	AREA (km ²)	SPP/AREA (x1000)
Worcester Karoo and Marginal Fynbos — 1	25	6	7	4	5	1	48	1 840	26
Little Karoo and Marginal Fynbos — 2	40	12	12	9	3	2	78	12 690	6
Steytlerville Karoo — 3	5	9	7	1	0	1	23	6 340	4
Noorsveld — 4	0	1	2	1	0	0	4	4 040	1
Great Karoo, Main Area — 5a	24	11	12	4	1	1	53	38 190	1
Great Karoo, Camdeboo — 5b	5	6	3	1	0	0	15	7 590	2
Tanqua (Ceres) Karoo — 6	14	7	9	3	3	0	36	12 150	3
Vanrhynsdorp Karoo — 7	44	8	28	5	2	1	88	14 610	6
Namaqualand — 8	69	24	29	6	2	0	130	45 910	3
Gariiep Centre: Richtersveld — 9a	7	6	9	2	1	0	25	2 830	9
Gariiep Centre: Coast — 9b	2	3	0	0	0	0	5	1 490	3
Roggeveld — 10	14	3	8	1	1	0	27	5 530	5
Southern Bushmanland — 11	44	11	23	4	1	0	83	17 150	5
Northern Bushmanland and Upper Karoo — 12	17	10	2	3	4	0	36	179 080	0,2
Sneeuberg Centre — 13	12	9	1	1	2	0	25	10 310	2



SOUTHERN MOUNTAIN REGION — MAP 4

BIOGEOGRAPHIC ZONE	U	I	R	V	E	X	TOTAL	AREA (km ²)	SPP/AREA (x1000)
Langeberge — L	50	15	37	11	5	0	118	1 970	60
Riviersonderend Mts. — RM	31	11	30	5	6	4	87	1 420	61
Outeniqua, Suuranys Mts. — O	27	2	22	12	3	0	66	4 370	15
Kouga Mountains — K	4	1	6	1	0	0	12	1 360	9
Baviaanskloof Mountains — B	3	5	11	4	1	0	24	2 310	10
Swartberge, Rooiberg and Kammanassie Mountains — SW	31	10	33	8	2	0	84	4 980	17
Witteberg Renosterveld — W	11	3	9	1	1	0	25	1 190	21
Mixed Renosterveld 1 — MR1	5	1	1	1	0	0	8	810	10
Mixed Renosterveld 2 — MR2	3	4	2	4	0	0	13	570	22
S.E. Coast Renosterveld — R1	6	3	11	8	1	1	30	500	60
Suurberg Grassy Fynbos — GF1	1	2	4	0	0	0	7	430	16
Humansdorp Fynbos — GF2	8	8	8	6	0	0	30	3 350	9
Southern Coastal Slopes — AM	9	3	6	6	0	0	24	1 700	14
Dune Fynbos — DF	3	0	0	1	0	0	4	210	19
Kaffrarian Thicket — KT	0	1	0	1	1	0	3	210	14
Valley Bushveld Zone — VB	19	4	14	8	1	0	46	5 130	9



Map 5: Zones in the Southern Coastal Mountain Region.

SOUTHERN COASTAL LOWLAND REGION — MAP 5

BIOGEOGRAPHIC ZONE	U	I	R	V	E	X	TOTAL	AREA (km ²)	SPP/AREA (x1000)
Strandveld 1 — S1	3	3	4	3	2	0	15	250	60
Strandveld 2 — S2	11	4	5	13	3	0	36	240	150
Strandveld 3 — S3	4	6	5	6	3	0	24	140	171
Dune Fynbos 1 — DF1	1	2	3	1	2	0	9	330	27
Dune Fynbos 2 — DF2	3	1	2	1	0	0	7	220	32
Limestone Fynbos 1 — LF1	6	5	15	3	3	0	32	1 120	29
Limestone Fynbos 2 — LF2	6	3	5	1	1	0	16	1 280	13
Soetanytsberg Limestone Fynbos 3 — LF3	1	0	4	8	1	0	14	160	88
Elim Dwarf Fynbos — CF+E	21	12	19	6	1	0	70	550	127
Coastal Renosterveld — R	48	18	38	29	12	4	149	5 620	27
Mixed Renosterveld and Fynbos — R/F	11	4	4	8	4	0	31	2 640	12
Mountain Fynbos 1 — MF1	17	5	17	10	4	1	54	400	143
Mountain Fynbos 2 — MF2	12	4	7	7	4	0	34	800	43
Mountain Fynbos 3 — MF3	7	3	16	9	1	0	34	150	227
Mountain Fynbos 4 — MF4	16	4	11	8	5	1	45	90	500
Valley Bushveld 1 — VB1	1	0	2	0	0	0	3	90	33
Valley Bushveld 2 — VB2	0	0	0	0	0	0	0	30	0
Valley Bushveld 3 — VB3	0	0	0	0	0	0	0	20	0
Valley Bushveld 4 — VB4	3	0	0	0	0	0	3	80	38
Valley Bushveld 5 — VB5	2	0	1	0	0	0	3	30	100

RECENT TITLES IN THIS SERIES

82. *The SANCOR Marine Sedimentology Programme January 1984-December 1988. I C Rust (editor). March 1984. 15 pp.
83. *A description of the major vegetation categories in and adjacent to the fynbos biome. E J Moll, B M Campbell, R M Cowling, L Bossi, M L Jarman and C Boucher. 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. S M Pierce. July 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. A V Hall (editor). December 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. L A Luscher (editor). December 1984. 42 pp.
95. National Programme for Weather, Climate and Atmosphere Research Annual Report 1984/5. 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. 33 pp.
- 101A Verslag van die Hoofprogram vir Navorsingsondersteuning. Februarie 1985. 30 pp.
- 101E Report of the Main Research Support Programme. Februarie 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 1985. 83 pp.
104. The plant communities of Swartboschkloof, Jonkershoek. D J Macdonald. 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 Kuseb 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.
108. Review of metal concentrations in southern African coastal waters, sediments and organisms. H F-KO Hennig. August 1985. 140 pp.
109. Coastal dunes of South Africa. K L Tinley. September 1985. 293 pp.
110. The limnology of Hartebeespoort Dam. NIWR. September 1985. 269 pp.
111. Management of invasive alien plants in the fynbos biome. I A W Macdonald, M L Jarman and P Beeston (editors). October 1985. 140 pp.
112. The SANKOR Marine Pollution Research Programme 1986-1990. October 1985. 16 pp.
113. Alien and translocated aquatic animals in southern Africa: a general introduction, checklist and bibliography. M N Bruton and S V Merron. October 1985. 59 pp.
114. Synthesis of field experiments concerning the grasslayer in the savanna regions of southern Africa. T G O'Connor. October 1985. 126 pp.
115. South African marine pollution survey report 1979-1982. B D Gardner, A D Connell, G A Eagle, A G S Moldan, R J Watling. December 1985. 81 pp.
116. Basic needs in rural areas. A report on a seminar held in Cape Town on 19 February 1985. December 1985. 103 pp.

*Out of print