Bothalia 36,2: 201–222 (2006)

Comparisons of invasive plants in southern Africa originating from southern temperate, northern temperate and tropical regions

L. HENDERSON*

Keywords: alien invasive plants, comparisons, southern Africa, temperate and tropical origins

ABSTRACT

A subset of invasive alien plant species in southern Africa was analysed in terms of their history of introduction, rate of spread, countries/region of origin, taxonomy, growth forms, cultivated uses, weed status and current distribution in southern Africa, and comparisons made of those originating from south of the tropic of Capricorn, north of the tropic of Cancer and from the tropics. The subset of 233 species, belonging to 58 families, includes all important declared species and some potentially important species. Almost as many species originate from temperate regions (112) as from the tropics (121). Most southern temperate species came from Australia (28/36), most tropical species from tropical America (92/121) and most northern temperate species from Europe (including the Mediterranean) and Asia (58/76). Transformers account for 33% of all species. More transformers are of tropical origin (36) than of northern temperate (24) and southern temperate origin (18). However, 50% of southern temperate species are transformers, compared to 32% of northern temperate and 29% of tropical species. Southern temperate transformer species are mainly woody trees and shrubs that were established on a grand scale as silvicultural crops, barriers (hedges, windbreaks and screens) and cover/binders. Most aquatics, herbs, climbers and succulent shrubs are from the tropics. Ornamentals are the single largest category of plants from all three regions, the tropics having contributed twice as many species as temperate regions.

INTRODUCTION

All terminology relating to invasive plants such as 'alien', 'invasive', 'naturalized', 'weed', 'environmental weed' and 'transformer' are according to Richardson *et al.* (2000) unless stated otherwise in the text. More than 1 000 alien plant species are known to be naturalized in southern Africa (Wells *et al.* 1986). A high proportion of these species are herbaceous, ruderal and agrestal weeds. This paper concentrates on a subset of 233 species extracted from the book 'Alien weeds and invasive plants' by Henderson (2001) and which contains all the major and some of the emerging environmental weeds. Major invaders are those invasive alien species that are well established, and which already have a substantial impact on natural and semi-natural ecosystems; emerging invaders currently have less influence but have attributes and potentially suitable habitat that could result in increased range and consequences in the next few decades (Nel *et al.* 2004). The list of species selected for this study includes virtually all the declared plants whose control, propagation and trade are subject to the Conservation of Agricultural Resources Act, Act 43 of 1983 (CARA), as amended in 2001.

Southern Africa has had a long history of plant introductions from various parts of the world (Wells *et al.* 1986). This paper aims to compare the plants that have originated from northern temperate, southern temperate and tropical regions in terms of their history of introduction, rate of spread, countries/region of origin, taxonomy, growth forms, cultivated uses, weed status and current distribution in southern Africa.

* Agricultural Research Council: Plant Protection Research Institute, c/o SANBI, Private Bag X101, 0001 Pretoria.
e-mail: henderson@sanbi.org
MS. received: 2005-09-08.

METHODS

The subset of 233 alien plant species selected for this study includes all declared species under CARA, excluding two hybrids that originated in South Africa (*Rubus ×proteus* and *Psidium ×durbanensis*), and two eucalypts for which there is little evidence of their invasiveness, *Eucalyptus paniculata* and *E. sideroxylon*. The regions of origin were checked against the United States Department of Agriculture's ARS Germplasm Resources Information Network (GRIN) database, the Missouri Botanical Garden's MBG: W3TROPICOS database, Mabberley (1997), and other literature sources.

Southern temperate species are defined as those species whose region of origin is entirely south of, or straddles, the tropic of Capricorn. This region includes the South American countries of Uruguay, Argentina, Chile and southern Brazil. It also includes New Zealand, Tasmania and Australia (Australian Central Territory, New South Wales, Victoria, South Australia, Western Australia and southern Queensland).

Northern temperate species are defined as those species whose region of origin is entirely north of, or straddles, the tropic of Cancer. This region includes Europe, North Africa, much of Asia, and North America.

Tropical species are defined as those species whose region of origin occurs entirely within the tropics or straddles either the tropics of Cancer or Capricorn. This region includes tropical America (the northern half of South America, Central America, Mexico and the West Indies), tropical Africa and Asia (much of India, Thailand and Malaysia), Indonesia, and tropical Australia.

The earliest dates of occurrence in southern Africa were obtained from specimen records in the Pretoria National Herbarium (PRE) and various literature sources. The quarter-degree squares occupied and current naturalized distributions of the species were obtained from the Southern African Plant Invaders Atlas (SAPIA) data-

base and the Pretoria National Herbarium. The SAPIA database which is housed at the Agricultural Research Council (ARC)—Plant Protection Research Institute in Pretoria, currently contains 50 000 locality records of more than 500 alien plant species. The database includes records from roadside surveys undertaken from 1979–1993 and from the SAPIA mapping project conducted from January 1994 until December 1998 (Henderson 1998), with further ad hoc records added to the present.

Weed status was extracted from Henderson (2001). The definitions of the various categories of environmental weeds are after Swarbrick (1991).

Environmental weeds

Transformers—plants which can dominate or replace any canopy or subcanopy layer of a natural or seminatural ecosystem, thereby altering its structure, integrity and functioning.

Potential transformers—plants that are already invading natural or seminatural habitats, and have the potential to dominate any canopy or subcanopy layer but not yet having a marked effect. They are either transformers elsewhere in the world or showing signs of this ability in southern Africa.

Special effect weeds—plants which can significantly degrade the value or purpose for which a natural or seminatural ecosystem is valued without necessarily dominating it or greatly altering its vegetational structure or functioning. Examples include weeds which compete with and replace similar native plants, are of high visual impact, poisonous, or have chemical irritants.

Minor weeds—plants that invade and persist in any canopy or subcanopy layer of a natural or seminatural ecosystem but cannot or do not dominate that layer or seriously alter the vegetation structure or its functioning, although the accumulation of several to many species may do so.

Ruderal and agrestal weeds

Mostly annual or biennial plants which are primarily weeds of waste places (ruderals) and cultivated lands (agrestals).

The lists of species originating from southern temperate, northern temperate and tropical regions are given in Appendices 1, 2 & 3.

RESULTS AND DISCUSSION

History of introduction of invasive species

Only 15 species were introduced before 1800 and all had their origins in northern temperate and tropical regions (Figure 1). The earliest species to arrive before the colonization of the Cape by the Dutch in 1652, were *Ricinus communis* (castor-oil plant) and *Achyranthes aspera* (burweed), believed to be of tropical African origin, and *Catharanthus roseus* (Madagascar periwinkle). All three species are likely to have had a long association with humans in Africa. *Ricinus communis* and *C. roseus* would have been used for their medicinal value, whereas *A. aspera* would have been dispersed by domestic livestock. There is evidence that *R. communis* was in the Eastern Cape more than 1 200 years ago (Brink 1988) and this begs the question whether it should be regarded as indigenous and not alien. All three of the aforementioned species are widespread in southern Africa but have not become major invaders.

The arrival of the Dutch at Cape Town in 1652 marks the start of the introduction of plant species from other continents that would eventually become major invaders. Seven species arrived between 1652 and 1700. Species of northern temperate origin were: *Nasturtium officinale* (watercress), *Quercus robur* (English oak), *Salix babylonica* (weeping willow), *Pinus pinaster* (cluster pine) and *P. pinea* (stone pine). Species of tropical origin were: *Opuntia ficus-indica* (sweet prickly pear) and *Datura stramonium* (common thorn apple). A further five species arrived before 1800. *Arundo donax* (giant reed) was the only northern temperate species, whereas species from the tropics were *Canna indica* (Indian shot), *Xanthium spinosum* (spiny cocklebur), presumably an accidental introduction, *Opuntia monacantha* (cochineal prickly pear) and *Psidium guajava* (guava). Six of the species introduced before 1800 (*Arundo donax, Opuntia ficus-indica, O. monacantha, Pinus pinaster, Psidium guajava* and *Salix babylonica*) are, or were previously,

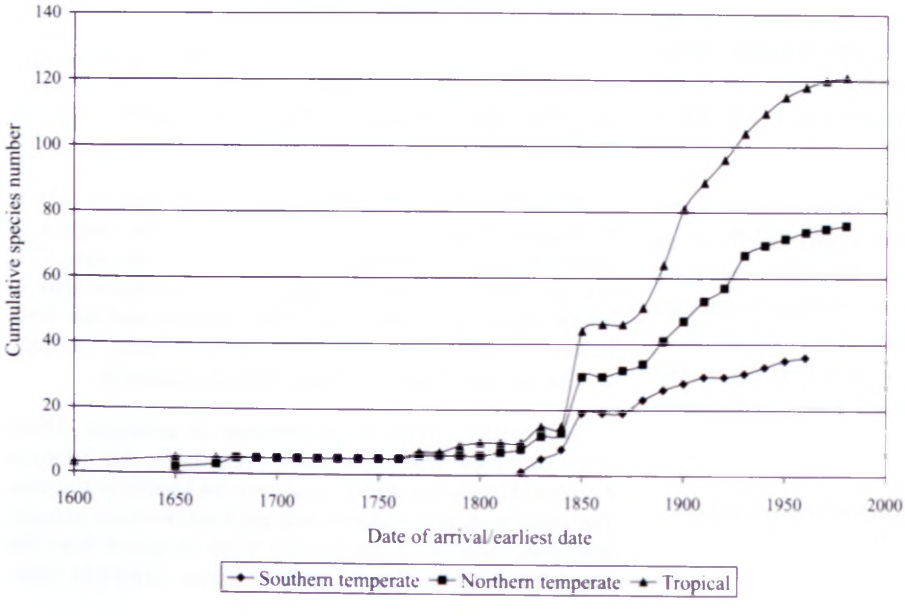

FIGURE 1.—History of introduction of species from tropical, northern temperate and southern temperate regions.

major invaders in southern Africa and have transformed landscapes. They have either reached or are close to the limits of their distribution in southern Africa. *Opuntia ficus-indica* and *O. monacantha* had reached pest status in South Africa by the early 1900s but following successful biological control are no longer regarded as problems in most parts of the country.

The greatest rate of arrival of species (1.45 species/year) occurred from 1820–1899. It was during this period that the first southern temperate species, *Acacia longifolia* (long-leaved wattle), was introduced in 1827 from Australia (Stirton 1978), 170 years after the introduction of the first northern temperate species. From the 1830s to the 1880s many more Australian woody species, belonging to the genera *Acacia, Atriplex, Eucalyptus, Grevillea, Hakea, Leptospermum, Paraserianthes, Pittosporum* and *Syzygium* were introduced as sand-binders, hedges, fodder plants and for timber. The first southern temperate species of South American origin to be introduced was *Opuntia aurantiaca* (jointed cactus) as an ornamental rockery plant in 1843.

Almost as many species arrived during the 1900s (103 species) as in the 1800s (115 species). Plants introduced prior to 1850 were largely utility plants, whereas after 1850 a greater proportion of the species were of ornamental value. This trend becomes more obvious in the 1900s. Up to the 1840s there is not a vast difference between the numbers of species from each of the three regions (southern temperate—10, northern temperate—19, tropical—15). After 1850 many more species of tropical origin were introduced than of northern temperate and southern temperate origin. The cumulative species curves in Figure 1 show a surge in species arrival during the 1850s. This may partly be an artefact of the very detailed records of plants in the Cape Town Botanic Gardens provided by McGibbon in 1858. Seventy one species in cultivation in the Cape Town Botanic Garden at this time are now on the list of 233 major and emerging invaders. This includes some of the worst environmental weeds such as *Chromolaena odorata* (triffid weed), *Lantana camara* (lantana), *Opuntia aurantiaca* (jointed cactus) and *Pereskia aculeata* (pereskia).

Rate of spread

Only a very rough estimate of rate of spread (total quarter-degree squares (QDS) divided by years since arrival) can be determined with the available data (Appendices 1, 2 & 3). This estimate is the average rate of spread of the entire known history of a species in southern Africa. One would not expect the rate to be constant over this time period. Historical data from the SAPIA database provides evidence that some species have had a slow rate of spread over much of their time period followed by exponential growth e.g. *Azolla filiculoides* (red water fern) and *Campuloclinium macrocephalum* (pompom weed).

The species that have shown the fastest average rate of spread in southern Africa are *Azolla filiculoides* (4.418 QDS/year, ornamental, tropical), *Prosopis glandulosa* var. *torreyana* and hybrids (mesquite trees: 4.097 QDS/year, agricultural crops, northern temperate), *Populus* ×*canescens* (grey poplar: 3.945 QDS/year, cover/binder, northern temperate), *Acacia mearnsii* (black wattle: 3.007 QDS/year, silvicultural crop, southern temperate), *Agave americana* (American agave: 2.986 QDS/year, barrier, tropical), *Melia azedarach* (seringa: 2.764 QDS/year, ornamental, tropical) and *Opuntia ficus-indica* (2.501 QDS/year, agricultural crop, tropical). While the dispersal of all these species has been assisted by humans, the current distributions of *Agave americana* and *Populus* ×*canescens* are almost entirely attributed to human-assisted dispersal. *Populus* ×*canescens* spreads only vegetatively by suckering, whereas *Agave americana* spreads mainly by suckering but also to a limited extent by seed.

The earliest introductions from all regions of origin have, on average, spread the furthest. This is shown in Figure 2 which plots the mean QDS occupied in 2003 against mean residence time for each of the regions of origin. The conclusion that can be drawn from this graph is that most species still have a long way to go before reaching their potential spread.

Countries/regions of origin

Almost as many species originated from temperate regions (112) as from the tropics (121) (Table 1). Most southern temperate species came from Australia (28/36), most tropical species from tropical America (Central and northern South America, Mexico and West Indies) (93/121) and most northern temperate species from Europe, the Mediterranean coastline of southern Europe and North Africa, and Asia (57/76). Only nine species are entirely of African and Madagascan origin.

Taxonomy

The subset of 233 species belongs to 58 families (Table 1). Most families (41) are of tropical origin; 28 families are of northern temperate origin and 11 families of southern temperate origin. The Fabaceae is by far the largest family with 41 species. Only the Fabaceae, Cactaceae and Poaceae have species from all three regions of origin.

The top families, with the most number of species in each of the regions are: Fabaceae, Myrtaceae and Proteaceae from southern temperate regions; Rosaceae, Fabaceae, Pinaceae, Oleaceae and Salicaceae from northern temperate regions and Fabaceae, Asteraceae, Solanaceae, Cactaceae and Myrtaceae from tropical regions.

Most genera are of tropical origin (Table 1). However, the largest genus, *Acacia*, with 13 species is from the southern temperate region (Australia). *Opuntia* is the only genus with species from all three regions (one from southern temperate, three from northern temperate, six from tropical regions). Few other genera are represented in more than one region (*Cortaderia, Cuscuta, Eucalyptus, Myriophyllum, Oenothera, Pinus, Solanum, Syzygium*).

Ten of the 58 families (17%) are alien to southern Africa (Appendices 1, 2 & 3). One family (Myoporaceae) is from southern temperate regions, three families (Fagaceae, Liliaceae *sensu stricto*, and Pinaceae) from northern temperate regions and six families (Agavaceae, Aristolochiaceae, Cannaceae, Casuarinaceae, Papaveraceae, Pinaceae and Salviniaceae) from the tropics. The

TABLE 1.—Summary of taxonomy, growth forms, weed status, region of origin and cultivated uses of species originating from southern temperate, northern temperate and tropical regions. Transformer species are given in bold

Characteristics	Southern temperate	Northern temperate	Tropical	Total
Taxonomy				
No. species	36 (**18**)	76 (**24**)	121 (**35**)	233 (**77**)
No. genera	17	45	74	128
No. families	11	28	41	58
Fabaceae spp.	14 (**9**)	8 (**3**)	19 (**4**)	41 (**16**)
Asteraceae spp.		2	12 (**3**)	14 (**3**)
Cactaceae spp.	2 (**1**)	3 (**1**)	9 (**6**)	14 (**8**)
Myrtaceae spp.	6 (**2**)		7 (**3**)	13 (**5**)
Solanaceae spp.	1		11(**3**)	12 (**3**)
Rosaceae spp.		11 (**4**)		11 (**4**)
Poaceae spp.	3 (**2**)	2 (**1**)	5 (**1**)	10 (**4**)
Pinaceae spp.		8 (**5**)	1 (**1**)	9 (**6**)
Convolvulaceae spp.		2	5 (**2**)	7 (**2**)
Oleaceae spp.		7		7
Salicaceae spp.		6 (**4**)		6 (**4**)
Passifloraceae spp.			5	5
Proteaceae spp.	5 (**3**)			5 (**3**)
Zingiberaceae spp.		4 (**4**)	1	5 (**4**)
Anacardiaceae spp.			3	3
Bignoniaceae spp.			3 (**2**)	3 (**1**)
Hydrocharitaceae spp.	1			1
Chenopodiaceae spp.	2 (**1**)	1		3 (**1**)
Myoporaceae spp.	1			1
Pittosporaceae spp.	1			1
Haloragaceae spp.		1	1 (**1**)	2 (**1**)
Brassicaceae spp.		2		2
Boraginaceae spp.		2		2
Liliaceae spp.		1		1
Lythraceae spp.		1		1
Onagraceae spp.		2	2	4
Simaroubaceae spp.		1		1
Ulmaceae spp.		3		3
Lauraceae spp.		1 (**1**)	1 (**1**)	2 (**2**)
Clusiaceae spp.		1		1
Cupressaceae spp.		1		1
Malvaceae spp.		1		1
Moraceae spp.		1 (**1**)		1 (**1**)
Apocynaceae spp.		1	2	3
Fagaceae spp.		1		1
Tamaricaceae spp.		2		2
Azollaceae spp.			1 (**1**)	1 (**1**)
Pontederiaceae spp.			2 (**1**)	2 (**1**)
Araceae spp.			1 (**1**)	1 (**1**)
Salviniaceae spp.			1 (**1**)	1 (**1**)
Amaranthaceae spp.			1	1
Papaveraceae spp.			2	2
Crassulaceae spp.			1	1
Cannaceae spp.			2	2
Davalliaceae spp.			1 (**1**)	1 (**1**)
Phytolaccaceae spp.			2	2
Asclepiadaceae spp.			1	1
Aristolochiaceae spp.			1	1
Basellaceae spp.			1	1
Polygonaceae spp.			2	2
Sapindaceae spp.			2 (**1**)	2 (**1**)
Agavaceae spp.			2	2
Myrsinaceae spp.			1	1
Casuarinaceae spp.			2	2
Verbenaceae spp.			2 (**1**)	2 (**1**)
Meliaceae spp.			2 (**1**)	2 (**1**)
Lamiaceae spp.			1	1
Euphorbiaceae spp.			1	1
Growth forms				
Grass spp.	3 (**2**)	2 (**1**)	5 (**1**)	10 (**4**)
Aquatic spp.	1	2	6 (**5**)	9 (**5**)
Herbaceous spp.	2	14 (**4**)	23 (**3**)	39 (**7**)
Climber spp.	0	3	22 (**6**)	25 (**6**)
Succulent tree & shrub spp.	2 (**1**)	3 (**1**)	10 (**5**)	15 (**7**)
Woody tree & shrub spp.	28 (**15**)	52 (**18**)	53 (**15**)	133 (**48**)
Region of origin				
Temperate Australian spp.	28 (78%)			
Temperate S American spp.	7 (19%)			
New Zealand spp.	1 (3%)			
Temperate Asian spp.		27 (36%)		
N American spp.		18 (24%)		
Eurasian spp.		16 (21%)		
European & Mediterranean spp.		14 (18%)		
Canary Isles spp.		1 (1%)		
Tropical American spp.			93 (77%)	
Tropical Asian & Australian spp.			18 (15%)	
Tropical African & Madagascan spp.			9 (7%)	
Pantropical spp.			1 (1%)	
Cultivated uses				
Ornamental spp.	29 (**12**)	61 (**17**)	106 (**34**)	196 (**63/32%**)
Barrier spp.	27 (**13**)	32 (**11**)	30 (**12**)	89 (**36/40%**)
Agricultural crop spp.	8 (**3**)	30 (**14**)	22 (**4**)	60 (**21/35%**)
Silvicultural crop spp.	9 (**7**)	11 (**8**)	4 (**3**)	24 (**18/75%**)
Cover/binder spp.	8 (**7**)	8 (**4**)	9 (**1**)	25 (**12/48%**)
Species with no uses	4 (**3**)	7 (**0**)	10 (**0**)	21 (**3/14%**)
Primary cultivated use				
Ornamental spp.	12 (**2**)	31 (**7**)	86 (**27**)	129 (**36/28%**)
Barrier spp.	10 (**6**)	14 (**3**)	7 (**2**)	31 (**11/35%**)
Agricultural crop spp.	1 (**0**)	13 (**6**)	11 (**3**)	25 (**9/36%**)
Silvicultural crop spp.	5 (**3**)	7 (**4**)	3 (**3**)	15 (**10/66%**)
Cover/binder spp.	4 (**4**)	4 (**4**)	4 (**0**)	12 (**8/66%**)
Species with no uses	4 (**3**)	7 (**0**)	10 (**0**)	21 (**3/14%**)

Pinaceae with nine species is the largest alien family. If it were not for *Rhipsalis baccifera*, the sole indigenous cactus in southern Africa, the Cactaceae would also be an alien family.

Ninety of 128 genera (70%) are alien to southern Africa (Appendices 1, 2 & 3). Eleven alien genera are of southern temperate origin, 33 alien genera are of northern temperate origin and 53 alien genera are of tropical origin. The remaining genera, with both alien and indigenous species, have some of the major invaders

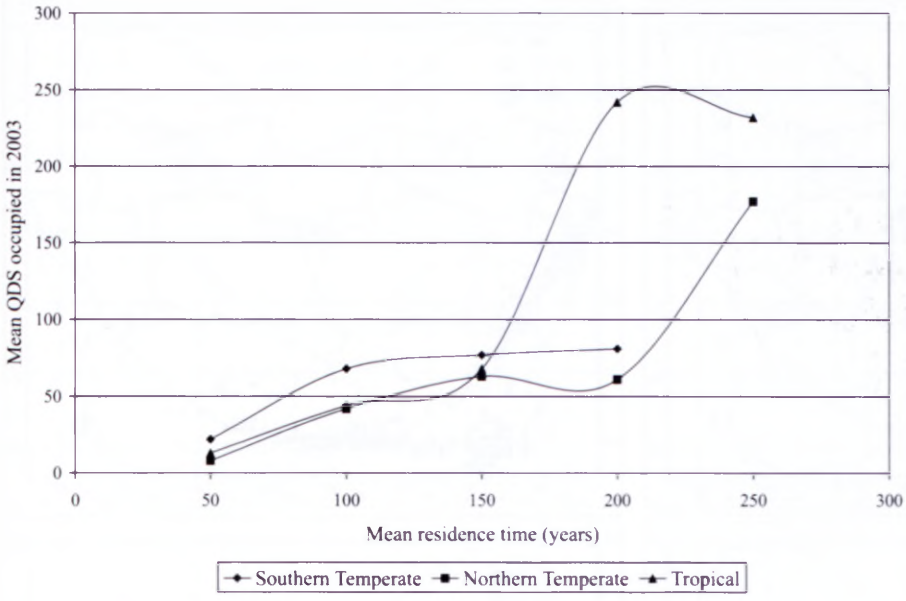

FIGURE 2.—Mean quarter-degree squares (QDS) occupied in 2003 against Mean residence time (years).

e.g. *Acacia, Azolla, Caesalpinia, Eichhornia, Lantana, Rubus, Salix, Solanum, Sesbania.*

Growth forms

Most aquatics, herbs, climbers and succulent shrubs are from the tropics (61 species) compared to only 27 species from temperate regions. Climbers are almost exclusively of tropical origin (22/25 species). Most woody trees and shrubs are from temperate regions (80 species) compared to 53 from tropical regions. Equal numbers of grasses (five species) originate from temperate and tropical regions (Table 1).

Cultivated uses

Ornamentals are the single largest category of plants from all three regions with 196/233 species having been used for ornamentation. Of these species, 129 have been used primarily (i.e. as a major use) as ornamentals, with twice as many species from tropical regions (86) than northern temperate (31) and southern temperate regions (12).

Barrier plants (hedges, windbreaks and screens) are the next largest category of cultivated plants. Thirty-one species have been used primarily as barriers, with more species from temperate regions (24 species) than the tropics (7 species). Almost equal numbers of agricultural crop species originated from temperate (14 species) and tropical regions (11 species). Most silvicultural crops are of temperate origin (12/15 species).

Weed status

Transformers account for 33% of all species. Thirty-five transformers are of tropical origin compared to 24 of northern temperate and 18 of southern temperate origin. However, 50% of southern temperate species are transformers, compared to 32% of northern temperate and 29% of tropical species. Southern temperate transformer species are mainly woody trees and shrubs that were established on a grand scale as silvicultural crops, barriers and cover/binders.

Although ornamentals constitute the largest category of cultivated plants, all the other categories (barriers, crops, cover/binders) have a much higher percentage of transfomer species. Sixty-six percent (18/27 species) of silvicultural crops and cover/binders are transformers, with seven species from southern temperate regions, eight species from northern temperate regions and three species from the tropics.

Thirty-one alien genera have transformer species; six are from southern temperate regions; 10 from northern temperate regions and 18 from tropical regions. Sixteen genera that have both alien and indigenous species have transformer species.

Current naturalized distributions

A visual examination of the current distributions of all species showed that there are about eight major distribution patterns or zones. These zones are illustrated in Figures 3 & 4. Further analysis of the species within each of the three major regions of origin showed that there was a concentration of species within certain zones which correlate with the biomes of southern Africa as defined by Rutherford (1997). The highest percentage (36%) of northern temperate species occur in the central high interior or Grassland Biome (Figure 5A which uses *Pyracantha angustifolia*, yellow firethorn, as an example). Forty-four percent of southern temperate species occur along the southern and southwestern seaboard, which includes the whole of the Fynbos and Forest Biomes (Figure 5B which uses *Acacia saligna*, Port Jackson, as an example). Fifty-three percent of tropical species are distributed along the eastern seaboard and northeastern interior, which coincides with the Savanna Biome (Figure 5C which uses *Jacaranda mimosifolia*, jacaranda, as an example).

CONCLUSIONS

All three regions of origin have made large contributions to alien plant invasion in southern Africa. Almost equal numbers of species, genera and families came from temperate and tropical regions, with the least from the southern temperate region and most from the tropics. The earliest introductions from all three regions have spread the furthest and most species still have a long way to go before reaching their potential spread.

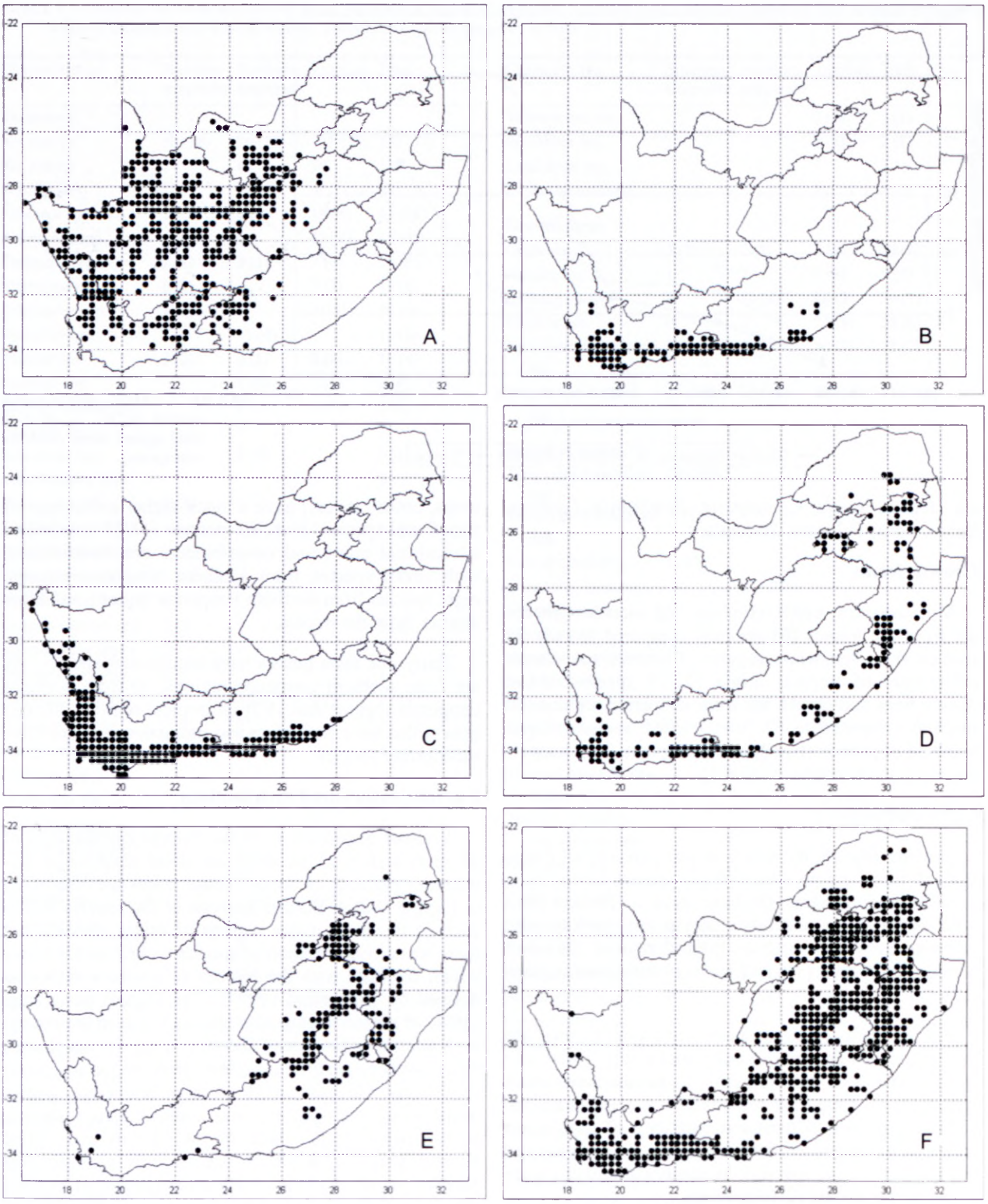

FIGURE 3.—A, Zone 1: western and central arid zone e.g. *Prosopis* species, mesquite trees; B, Zone 2A: southern 'Mediterranean' zone e.g. *Pinus pinaster*, cluster pine; C, Zone 2B: southern and southwestern 'Mediterranean' zone e.g. *Acacia cyclops*, red eye/rooikrans; D, Zone 3: southern and eastern cool, moist zone e.g. *Acacia melanoxylon*, Australian blackwood; E, Zone 4A: highveld zone e.g. *Pyracantha angustifolia*, yellow firethorn; F, Zone 4B: highveld zone with extension to seaboard e.g. *Populus ×canescens*, grey poplar.

Ornamentals are the single largest category of plants from all three regions but the tropics has contributed twice as many species as temperate regions. Temperate regions have provided slightly more transformers than the tropics and these are mainly plants that have been cultivated for non-ornamental purposes. The southern temperate region, with species mainly from Australia, has provided a disproportionate number of transformers (18/36 species or 50%), compared with 32% from northern temperate and 29% from tropical regions.

The current distributions of invasive plants in southern Africa are a reflection of the climatic zones of their origin. Northern temperate species are concentrated in the cold, high interior or Grassland Biome. Southern temperate species are concentrated along the southern and southwestern seaboard which includes the whole

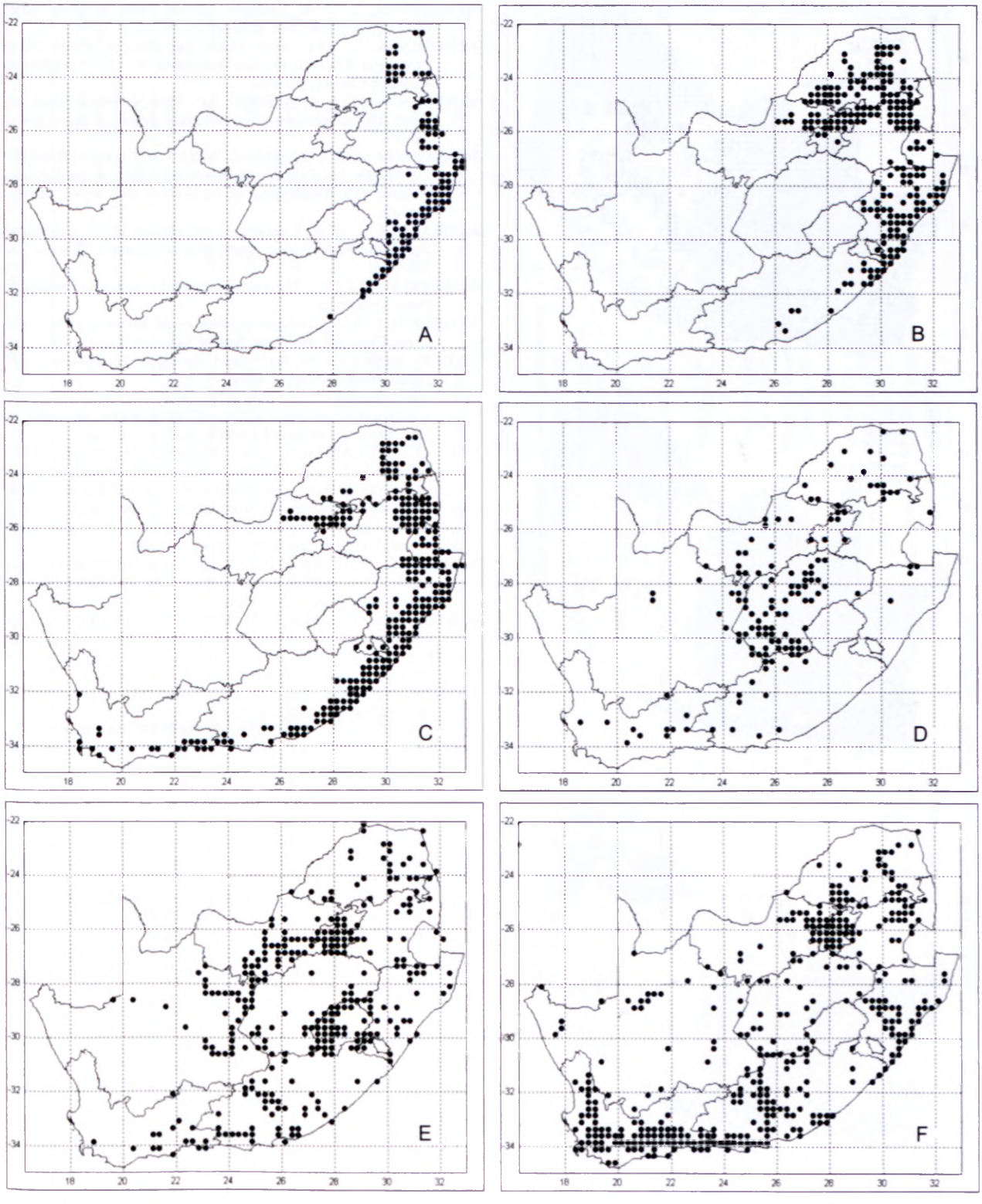

FIGURE 4.—A, Zone 5: eastern seaboard and escarpment e.g. *Chromolaena odorata*, triffid weed; B, Zone 6A: eastern seaboard, escarpment and middleveld e.g. *Jacaranda mimosifolia*, jacaranda; C, Zone 6B: eastern seaboard and escarpment e.g. *Lantana camara*, lantana; D, Zone 7A: dry interior e.g. *Opuntia imbricata*, imbricate cactus; E, Zone 7B: dry interior and extension to moister areas e.g. *Datura stramonium*, common thorn apple; F, Zone 8: widespread e.g. *Arundo donax*, giant reed.

of the Fynbos and Forest Biomes. Tropical species are concentrated along the eastern seaboard and northeastern interior which coincides with the greater part of the Savanna Biome.

REFERENCES

BRADLOW, F.R. 1965. *Baron Von Ludwig and the Ludwig's-burg garden*. Balkema, Cape Town.

BRINK, E. 1988. Interesting record. *The elephant's child*. Newsletter of the Albany Museum 11: 3.

CHIPPINDALL, L.K.A. 1955. A guide to the identification of grasses in South Africa. In D. Meredith, *The grasses and pastures of South Africa*: 5–527. Central News Agency, Cape Town.

COETSEE, J. 1989. Waak teen die bose kaktus. *Landbouweekblad*, 24 March 1989: 24–27.

CRAN, M. 1927. *The gardens of Good Hope*. Jenkins, London.

DE BEER, H. & ZIMMERMANN, H.G. 1986. Harrisia cactus. Weeds A.11/1986. *Farming in South Africa*.

ECKLON, C.F. 1830. A list of plants found in the district of Uitenhage

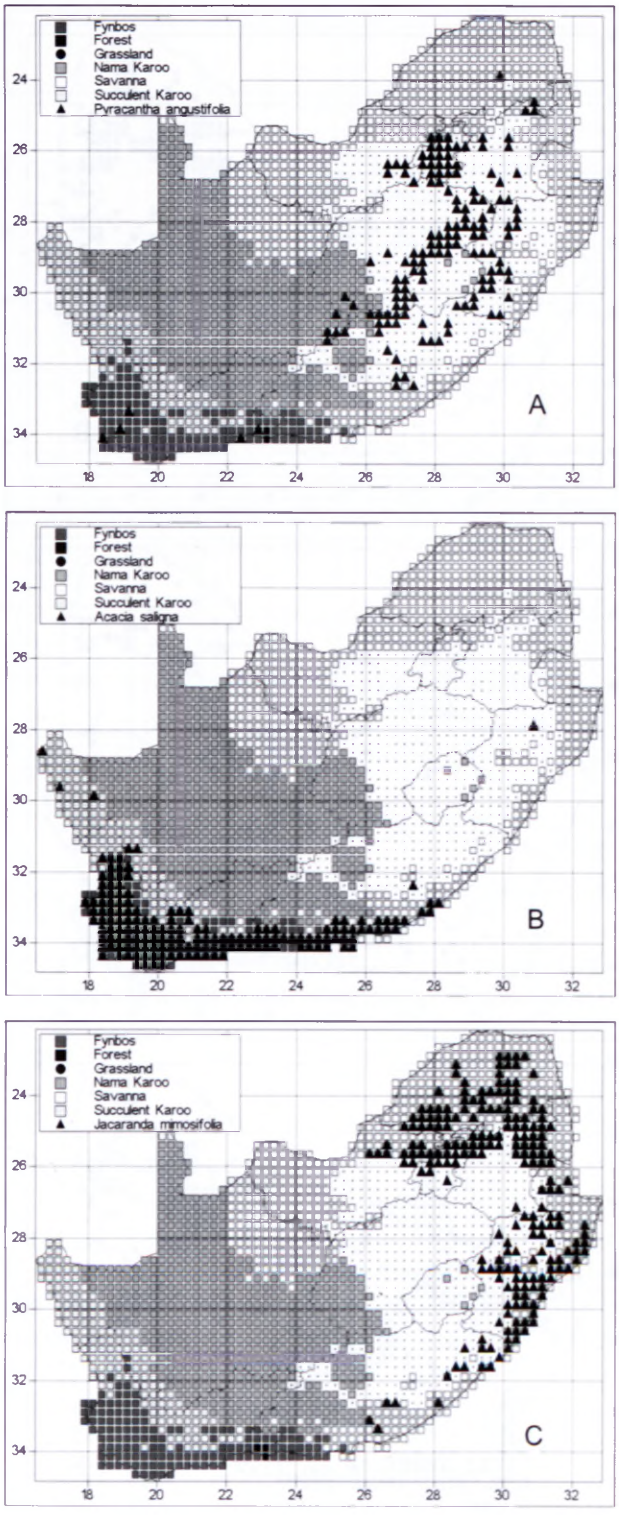

FIGURE 5.—A, northern temperate species are concentrated in the cold, high interior or Grassland Biome e.g. *Pyracantha angustifolia*, yellow firethorn (zone 4A); B, southern temperate species are concentrated along the southern and south western seaboard or Fynbos and Forest Biomes e.g. *Acacia saligna*, Port Jackson (zone 2B); C, tropical species are concentrated along the eastern seaboard and north eastern interior or the greater part of the Savanna Biome e.g. *Jacaranda mimosifolia*, jacaranda (zone 6A). Biomes according to Rutherford (1997).

between the months of July 1829 and February 1830. *South African Quarterly Journal* 1: 358–380.

GELDENHUYS, C.J., LE ROUX, P.J. & COOPER, K.H. 1986. Alien invasions in indigenous evergreen forest. In I.A.W. Macdonald, F.J. Kruger & A.A. Ferrar, *The ecology and management of biological invasions in southern Africa*: 119–131. Oxford University Press, Cape Town.

HENDERSON, L. 1998. Southern African Plant Invaders Atlas (SAPIA). *Applied Plant Sciences* 12: 31, 32.

HENDERSON, L. 2001. *Alien weeds and invasive plants*. Plant Protection Research Institute Handbook No. 12. Agricultural Research Council, Pretoria.

HENDERSON, M. & ANDERSON, J.G. 1966. Common weeds in South Africa. *Memoirs of the Botanical Survey of South Africa* No. 37.

HENDERSON, M., FOURIE, D.M.C., WELLS, M.J. & HENDERSON, L. 1987. *Declared weeds and alien invader plants in South Africa*. Bulletin 413, Department of Agriculture and Water Supply, Pretoria.

HUBBARD, C.S. 1926. A review of the species of *Populus* introduced into South Africa. *South African Journal of Science* 23: 340–365.

MABBERLEY, D.J. 1997. *The plant-book*, edn 2. Cambridge University Press, Cambridge.

McGIBBON, J. 1858. *Catalogue of plants in the botanic garden, Cape Town, Cape of Good Hope*. Saul & Solomon, Cape Town.

MEDLEY WOOD, J. 1894. *Preliminary catalogue of indigenous Natal plants*. Natal Mercury, Durban.

MISSOURI BOTANICAL GARDEN. *VAST (VAScular Tropicos) nomenclatural database (MBG: W3TROPICOS)*. Available at http://www.mobot.mobot.org/W3T/search/vast.html.

NEL, J.L., RICHARDSON, D.M., ROUGET, M., MGIDI, T.N., MDZEKE, N., LE MAITRE, D.C., VAN WILGEN, B.W., SCHONEGEVEL, L., HENDERSON, L. & NESER, S. 2004. A proposed classification of alien invasive plant species in South Africa: towards prioritizing species and areas for management action. *South African Journal of Science* 100: 53–64.

NESER, S. & ANNECKE, D.P. 1973. Biological control of weeds in South Africa. *Entomological Memoir* No. 28. Department of Agricultural Technical Services, Pretoria.

OOSTHUIZEN, G.J. & WALTERS, M.M. 1961. Control of water fern with diesoline. *Farming in South Africa* 37: 35–37.

PHILLIPS, E.J., HARDING, J.J. & DU TOIT, R. 1939. American bramble. *Farming in South Africa* 14: 272–274.

POYNTON, R.J. 1959. *Notes on exotic forest trees in South Africa*. Bulletin No. 38. The Government Printer, Pretoria.

RICHARDSON, D.M., PYŠEK, P., REJMÁNEK, M., BARBOUR, M.G., PANETTA, F.D. & WEST, C.J. 2000. Naturalization and invasion of alien plants: concepts and definitions. *Diversity and Distributions* 6: 93–107.

RUTHERFORD, M.C. 1997. Categorization of biomes. In R.M. Cowling, D.M. Richardson & S.M. Pierce, *Vegetation of southern Africa*: 91–98. Cambridge University Press, Cambridge.

SHAUGHNESSY, G.L. 1986. A case study of some woody plant introductions to the Cape Town area. In I.A.W. Macdonald, F.J. Kruger & A.A. Ferrar, *The ecology and management of biological invasions in southern Africa*: 37–43. Oxford University Press, Cape Town.

SIM, T.R. 1905. *Tree planting in Natal*. Davis, Pietermaritzburg.

SIM, T.R. 1919. *Flowering trees and shrubs for use in South Africa*. The Specialty Press, Johannesburg.

SMITH, C.A. 1966. Common names of South African plants. *Memoirs of the Botanical Survey of South Africa* No. 35: 1–642.

SMITH, H.H. 1929. *Sisal production and preparation*. Bale, London.

STIRTON, C.H. 1978. *Plant invaders: beautiful but dangerous*. The Department of Nature and Environmental Conservation of the Cape Provincial Administration, Cape Town.

STORR LISTER, J. 1884. *Practical hints on tree-planting in the Cape Colony*. Cape Colonial Forestry Department, Cape Town.

SWARBRICK, J.T. 1991. Towards a rating scheme for environmental weeds. *Plant Protection Quarterly* 6: 185.

UNITED STATES DEPARTMENT OF AGRICULTURE: ARS, NATIONAL GENETIC RESOURCES PROGRAM. *Germplasm Resources Information Network—(GRIN)* [Online Database] National Germplasm Resources Laboratory, Beltsville, Maryland. Available at http://www.ars-grin.gov/npgs/tax/index.html.

VAN DEN BERG, M.A. 1977. Natural enemies of certain acacias in Australia. *Proceedings of the Second National Weeds Conference of South Africa, Stellenbosch*: 75–82. Balkema, Cape Town.

WELLS, M.J., POYNTON, R.J., BALSINHAS, A.A., MUSIL, K.J., JOFFE, H., VAN HOEPEN, E. & ABBOTT, S.K. 1986. The history of introduction of invasive plants to southern Africa. In I.A.W. Macdonald, F.J. Kruger & A.A. Ferrar, *The ecology and management of biological invasions in southern Africa*: 21–35. Oxford University Press, Cape Town.

WILD, H. 1961. Harmful aquatic plants in Africa and Madagascar. Joint CCTA / CSA Project No. 14. *Kirkia* 2 supplement.

ZIMMERMANN, H.G. & VAN DE VENTER, H.A. 1981. Jointed cactus. Weeds A1/1981. *Farming in South Africa*.

APPENDIX 1.—Southern temperate species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
Acacia baileyana	Fabaceae	Woody tree/ shrub	#Ornament, barrier	Australia	1919 (Sim 1919)	Invasive, potential transformer	87	84	1.036	4B
Acacia cyclops	Fabaceae	Woody tree/ shrub	#Cover/binder, barrier	Australia	?1835 (Stirton 1978)	Transformer	169	168	1.006	2B
Acacia dealbata	Fabaceae	Woody tree/ shrub	Silvicultural crop, #barrier, ornament	Australia	1858 (McGibbon 1858)	Transformer	259	145	1.786	4B
Acacia decurrens	Fabaceae	Woody tree/ shrub	Silvicultural crop, #barrier, ornament	Australia	1880–1890 (Van den Berg 1977)	Transformer	103	123	0.837	4A
Acacia elata	Fabaceae	Woody tree/ shrub	#Ornament, barrier	Australia	1937 (PRE)	Invasive, potential transformer	35	66	0.530	3
Acacia implexa	Fabaceae	Woody tree/ shrub	Ornament	Australia	?1850s	Invasive, potential transformer	2 u	153	0.013	2A
Acacia longifolia	Fabaceae	Woody tree/ shrub	#Cover/binder, barrier, ornament	Australia	1827 (Stirton 1978)	Transformer	96	176	0.545	3
Acacia mearnsii	Fabaceae	Woody tree/ shrub	#Silvicultural crop, barrier, ornament	Australia	1858 (McGibbon 1858)	Transformer	436	145	3.007	3
Acacia melanoxylon	Fabaceae	Woody tree/ shrub	#Silvicultural crop, barrier, ornament	Australia	1848 (Stirton 1978)	Transformer	138	155	0.890	3
Acacia paradoxa	Fabaceae	Woody tree/ shrub	#?Ornament, barrier	Australia	1858 (McGibbon 1858)	Naturalized, potential transformer	1	145	0.007	2A
Acacia podalyriifolia	Fabaceae	Woody tree/ shrub	#Ornament, barrier	Australia	1942 (PRE)	Invasive, potential transformer	58	61	0.951	6B
Acacia pycnantha	Fabaceae	Woody tree/ shrub	#Silvicultural crop, cover/binder, barrier, ornament	Australia	1892 (Stirton 1978)	Transformer	35	111	0.315	2A
Acacia saligna	Fabaceae	Woody tree/ shrub	Silvicultural crop, agricultural crop, #cover/binder, barrier, ornament	Australia	?1833 (Stirton 1978)	Transformer	161	170	0.947	2B
Atriplex inflata (= *A. lindleyi* subsp. *inflata*)	Chenopodiaceae	Herb	None	Australia	1906 (PRE)	Transformer	166	97	1.711	1
Atriplex nummularia	Chenopodiaceae	Woody tree/ shrub	#Agricultural crop, barrier	Australia	?1887 (PRE literature)	Invasive, potential transformer	173	116	1.491	1
**Cortaderia selloana*	Poaceae	Grass	#Ornament, cover/binder	S America	1955 (Chippindall 1955)	Invasive, potential transformer	9	48	0.188	3
**Echinopsis spachiana*	Cactaceae	Succulent tree/shrub	#Ornament, barrier	S America	?1940 (PRE)	Invasive, potential transformer	57	63	0.905	1
**Egeria densa*	Hydrocharitaceae	Aquatic	Ornament	S America	1966 (Henderson & Anderson 1966)	Invasive, potential transformer	3	37	0.081	6B
**Eucalyptus cladocalyx*	Myrtaceae	Woody tree/ shrub	#Silvicultural crop, agricultural crop (honey), barrier, ornament	Australia	1883 (Poynton 1959)	Invasive, potential transformer	37 u	120	0.308	2A

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 1.—Southern temperate species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Eucalyptus conferruminata* (*E. lehmannii* misapplied)	Myrtaceae	Woody tree/ shrub	Silvicultural crop, cover/binder, #barrier, agricultural crop (honey)	Australia	1900 (PRE)	Transformer	41	103	0.398	2B
**Eucalyptus diversicolor*	Myrtaceae	Woody tree/ shrub	#Silvicultural crop, barrier, agricultural crop (honey), ornament	Australia	1881 (Poynton 1959)	Invasive, potential transformer	49	122	0.402	2B
**Grevillea robusta*	Proteaceae	Woody tree/ shrub	#Ornament, barrier, silvicultural crop	Australia	1858 (McGibbon 1858)	Invasive, potential transformer	55	145	0.379	6B
**Hakea drupacea*	Proteaceae	Woody tree/ shrub	Ornament, #cover/binder, barrier	Australia	1850 (Shaugnessy 1986)	Transformer	29	153	0.190	2A
**Hakea gibbosa*	Proteaceae	Woody tree/ shrub	Ornament, #barrier	Australia	1835 (Shaugnessy 1986)	Transformer	21	168	0.125	2A
**Hakea salicifolia*	Proteaceae	Woody tree/ shrub	Ornament, #barrier	Australia	1858 (McGibbon 1858)	Naturalized	5	145	0.034	3
**Hakea sericea*	Proteaceae	Woody tree/ shrub	Ornament, cover/binder, #barrier	Australia	1858 (Shaugnessy 1986)	Transformer	83	145	0.572	2A
**Leptospermum laevigatum*	Myrtaceae	Woody tree/ shrub	Ornament, #barrier, cover/binder	Australia	1850 (Shaugnessy 1986)	Transformer	40	153	0.261	2A
Metrosideros excelsa	Myrtaceae	Woody tree/ shrub	Ornament, #barrier, agricultural crop (honey)	New Zealand	?1843 (Bradlow 1965)	Invasive, potential transformer	2	160	0.013	2A
**Myoporum tenuifolium*	*Myoporaceae	Woody tree/ shrub	Ornament, #barrier	Australia	1911 (PRE)	Invasive, potential transformer	32	92	0.345	2B
**Nassella tenuissima*	Poaceae	Grass	None	S America	1899–1902 (Wells *et al.* 1986)	Transformer	1	104	0.010	4A
**Nassella trichotoma*	Poaceae	Grass	None	S America	1899–1902 (Wells *et al.* 1986)	Transformer	12	104	0.115	4A
**Opuntia aurantiaca*	Cactaceae	Succulent tree/shrub	Ornament	S America	1843 (Zimmermann & Van de Venter 1981)	Transformer	63 u	160	0.394	7A
**Paraserianthes lophantha*	Fabaceae	Woody tree/ shrub	#Ornament, agricultural crop (honey)	Australia	1833 (Stirton 1978)	Transformer	54	170	0.318	2B
Pittosporum undulatum	Pittosporaceae	Woody tree/ shrub	Ornament, #barrier	Australia	1858 (McGibbon 1858)	Invasive, potential transformer	4 u	145	0.028	2A
Solanum elaeagnifolium	Solanaceae	Herb	None	S America	1952 (Henderson *et al.* 1987)	Ruderal & agrestal weed	53	51	1.040	7B
Syzygium paniculatum	Myrtaceae	Woody tree/ shrub	#Ornament, barrier, agricultural crop	Australia	1858 (McGibbon 1858)	Invasive, potential transformer	3 u	145	0.021	6B

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 2.—Northern temperate species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Ailanthus altissima*	Simaroubaceae	Woody tree/ shrub	#Ornament, barrier	Asia	1834 (Bradlow 1965)	Invasive, potential transformer	33	169	0.195	3
**Alhagi maurorum*	Fabaceae	Woody tree/ shrub	None	Europe & Asia	1922 (PRE)	Agrestal weed & potential transformer	10	81	0.123	1
**Arundo donax*	Poaceae	Grass	#Agricultural crop, ornamental, barrier	Mediterranean & Asia	?1700s (PRE) 1811	Transformer	379	>200	1.895	8
Celtis australis	Ulmaceae	Woody tree/ shrub	Ornament	Mediterranean	1894 (Sim 1905)	Invasive, special effect weed	?	109	?	4A
Celtis occidentalis	Ulmaceae	Woody tree/ shrub	Ornament	N America	1905 (Sim 1905)	Invasive, special effect weed	?	98	?	4A
Celtis sinensis	Ulmaceae	Woody tree/ shrub	Ornament	Asia	1905 (Sim 1905)	Invasive, special effect weed	?	98	?	4A
**Cinnamomum camphora*	Lauraceae	Woody tree/ shrub	#Ornament, silvicultural crop, agricultural crop (honey)	Asia	1846 (PRE)	Transformer	10 u	157	0.064	6B
**Cirsium vulgare*	Asteraceae	Herb	None	Europe, N Africa & Asia	1898 (PRE)	Agrestal, ruderal & special effect weed	192	105	1.829	4B
Convolvulus arvensis	Convolvulaceae	Climber	None	Europe & Asia	1900 (PRE)	Agrestal & ruderal weed	23	103	0.223	4B
**Coreopsis lanceolata*	Asteraceae	Herb	Ornament	N America	1962 (PRE)	Invasive, special effect weed	16	41	0.390	6A
**Cotoneaster franchetii*	Rosaceae	Woody tree/ shrub	Ornament, #barrier, agricultural crop (honey)	Asia	1937 (PRE)	Invasive, potential transformer	7	91	0.077	4A
**Cotoneaster pannosus*	Rosaceae	Woody tree/ shrub	Ornament, #barrier, agricultural crop (honey)	Asia	1931 (PRE)	Invasive, potential transformer	25	72	0.347	4A
Cuscuta campestris	Convolvulaceae	Climber	None	N America	1894 (PRE)	Invasive, special effect weed	82	109	0.752	7B
**Cytisus scoparius*	Fabaceae	Woody tree/ shrub	#Ornament, barrier	Europe	1858 (McGibbon 1858)	Invasive, potential transformer	10	145	0.069	4A
**Echium plantagineum*	Boraginaceae	Herb	#Ornament, agricultural crop (honey)	Europe & Asia	1858 (McGibbon 1858)	Agrestal & ruderal weed	51	145	0.352	2A
**Echium vulgare*	Boraginaceae	Herb	#Ornament, agricultural crop (honey)	Europe & Asia	1913 (PRE)	Agrestal & ruderal weed	29	90	0.322	2A
**Eriobotrya japonica*	Rosaceae	Woody tree/ shrub	Ornament, #agricultural crop	Asia	1858 (McGibbon 1858)	Invasive, special effect weed	5	145	0.034	6B
**Genista monspessulana* (= *Cytisus monspessulanus*)	Rosaceae	Woody tree/ shrub	Ornament	Mediterranean	1900 (PRE)	Invasive, potential transformer	3	103	0.029	2A

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 2.—Northern temperate species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Gleditsia triacanthos*	Fabaceae	Woody tree/ shrub	#Agricultural crop, cover/ binder, ornament	N America	1831 (Bradlow 1965)	Invasive, potential transformer	115	172	0.669	4A
**Hedychium coccineum*	Zingiberaceae	Herb	Ornament	Asia	1957 (PRE)	Transformer	4	46	0.087	6B
**Hedychium coronarium*	Zingiberaceae	Herb	Ornament	Asia	1931 (PRE)	Transformer	15	72	0.208	6B
**Hedychium flavescens*	Zingiberaceae	Herb	Ornament	Asia	1931 (PRE)	Transformer	6	72	0.083	6B
**Hedychium gardnerianum*	Zingiberaceae	Herb	Ornament	Asia	1930 (PRE)	Transformer	12	73	0.164	6B
Hypericum perforatum	Clusiaceae	Woody tree/ shrub	#Ornament, agricultural crop (medicinal)	Mediterranean & Eurasia	1942 (Henderson *et al.* 1987)	Invasive, special effect weed	13	61	0.213	2A
Jasminum humile	Oleaceae	Woody tree/ shrub	#Ornament, barrier	Asia	1881 (PRE)	Naturalized, special effect weed	2	122	0.016	4A
**Juniperus virginiana*	Cupressaceae	Woody tree/ shrub	Ornament, #barrier	N America	1906 (Poynton 1959)	Invasive, potential transformer	17	97	0.175	4A
Lepidium draba	Brassicaceae	Herb	None	Mediterranean & Eurasia	1931 (Henderson & Anderson 1966)	Agrestal & ruderal weed	4	72	0.056	4A
**Ligustrum japonicum*	Oleaceae	Woody tree/ shrub	Ornament, #barrier	Asia	1927 (PRE)	Invasive, potential transformer	7 u	76	0.092	4A
**Ligustrum lucidum*	Oleaceae	Woody tree/ shrub	Ornament, #barrier	Asia	1858 (McGibbon 1858)	Invasive, potential transformer	12 u	145	0.083	4A
**Ligustrum ovalifolium*	Oleaceae	Woody tree/ shrub	Ornament, #barrier	Asia	1932 (PRE)	Invasive, potential transformer	3 u	71	0.042	6A
**Ligustrum sinense*	Oleaceae	Woody tree/ shrub	Ornament, #barrier	Asia	1924 (PRE)	Invasive, potential transformer	8 u	79	0.101	6A
**Ligustrum vulgare*	Oleaceae	Woody tree/ shrub	Ornament, #barrier	Asia	1858 (McGibbon 1858)	Invasive, potential transformer	3 u	145	0.021	6A
**Lilium formosanum*	*Liliaceae	Herb	Ornament	Asia	1962 (PRE)	Invasive, special effect weed	16	41	0.390	6A
**Lonicera japonica*	Oleaceae	Climber	#Ornament, barrier	Asia	1858 (McGibbon 1858)	Invasive, potential transformer	5	145	0.034	6A
**Lythrum salicaria*	Lythraceae	Herb	Ornament	Eurasia	1976 (PRE)	Naturalized, potential transformer	1	27	0.037	2A
**Malva dendromorpha* (= *Lavatera arborea*)	Malvaceae	Woody tree/ shrub	Ornament, #?agricultural crop (fodder & honey)	Europe	1858 (McGibbon 1858)	Ruderal & special effect weed	18	145	0.124	2B
Morus alba	Moraceae	Woody tree/ shrub	Ornament, #agricultural crop	Asia	1831 (Bradlow 1965)	Transformer	133	172	0.773	6A
**Myriophyllum spicatum*	Halorogaceae	Aquatic	Ornament	Europe, N Africa & Asia	1830 (Ecklon 1830)	Invasive, potential transformer	24	173	0.139	6B

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 2.—Northern temperate species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Nasturtium officinale* (= *Rorippa nasturtium-aquaticum*)	Brassicaceae	Aquatic	Agricultural crop	Europe	1650s (Wells *et al.* 1986)	Invasive, special effect weed	51	350	0.146	4B
**Nerium oleander*	Apocynaceae	Woody tree/ shrub	#Ornament, barrier	Mediterranean	1811 (Stirton 1978)	Invasive, special effect weed	24	192	0.125	1
**Oenothera biennis*	Onagraceae	Herb	Ornament, #agricultural crop (medicinal)	N America	?1858 (McGibbon 1858)	Invasive, potential transformer	19	145	0.131	4A
**Opuntia engelmannii* (= *O. lindheimeri*)	Cactaceae	Succulent tree/shrub	Ornament	N America	1937 (PRE)	Invasive, potential transformer	12	63	0.190	1
**Opuntia fulgida*	Cactaceae	Succulent tree/shrub	Ornament	N America	1940s (Coetsee 1989)	Transformer	10	66	0.152	7A
**Opuntia humifusa*	Cactaceae	Succulent tree/shrub	Ornament	N America	?1930s	Invasive, potential transformer	26	73	0.356	6A
**Orobanche minor*	Onagraceae	Herb	None	Europe	1951 (PRE)	Agrestal & ruderal weed	4	52	0.077	2A
**Pinus canariensis*	*Pinaceae	Woody tree/ shrub	#Silvicultural crop, barrier, ornament	Canary Isles	1884 (Poynton 1959)	Invasive, potential transformer	7	119	0.059	2A
**Pinus elliottii*	*Pinaceae	Woody tree/ shrub	#Silvicultural crop, barrier	N America	1919 (Poynton 1959)	Transformer	34	84	0.405	6A
**Pinus halepensis*	*Pinaceae	Woody tree/ shrub	Silvicultural crop, #barrier, ornament	Mediterranean	1827 (Shaughnessy) 1986)	Transformer	85	176	0.483	2A
**Pinus pinaster*	*Pinaceae	Woody tree/ shrub	#Silvicultural crop, barrier	Mediterranean	1685–1693 (Shaughnessy 1986)	Transformer	86	318	0.270	2A
**Pinus pinea*	*Pinaceae	Woody tree/ shrub	#Silvicultural crop, ornament, agricultural crop, barrier	Mediterranean	1685–1693 (Shaughnessy 1986)	Invasive, special effect weed	18	318	0.057	3
**Pinus radiata*	*Pinaceae	Woody tree/ shrub	#Silvicultural crop, barrier	N America	1858 (McGibbon 1858)	Transformer	71	145	0.490	2B
**Pinus roxburghii*	*Pinaceae	Woody tree/ shrub	#Barrier, ornamental	Asia	1858 (McGibbon 1858)	Invasive, potential transformer	4	145	0.028	4A
**Pinus taeda*	*Pinaceae	Woody tree/ shrub	#Silvicultural crop, barrier, ornament	N America	1899 (Poynton 1959)	Transformer	7	104	0.067	6A
**Populus alba*	Salicaceae	Woody tree/ shrub	Silvicultural crop, #barrier, ornament	N Africa, Europe & Asia	1858 (McGibbon 1858)	Transformer	15	145	0.103	4A
**Populus deltoides*	Salicaceae	Woody tree/ shrub	#Silvicultural crop, agricultural crop (honey), ornament	N America	1878 (Poynton 1959)	Naturalized, potential transformer	100	125	0.800	4A

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 2.—Northern temperate species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Populus nigra* var. *italica*	Salicaceae	Woody tree/ shrub	Ornament, #barrier, cover/ binder, agricultural crop (honey)	Europe & Asia	1858 (McGibbon 1858)	Naturalized, potential transformer	90	145	0.621	4A
**Populus ×canescens*	Salicaceae	Woody tree/ shrub	Silvicultural crop, #cover/ binder, barrier, ornament	Europe & Asia	1875 (Hubbard 1926)	Transformer	505	128	3.945	4B
**Prosopis glandulosa* var. *torreyana* and hybrids	Fabaceae	Woody tree/ shrub	#Agricultural crop, ornament (shade)	N America	1900 (Stirton 1978)	Transformer	422	103	4.097	1
**Prosopis velutina*	Fabaceae	Woody tree/ shrub	#Agricultural crop, ornament (shade)	N America	1914 (PRE)	Transformer	48	89	0.539	1
**Pyracantha angustifolia*	Rosaceae	Woody tree/ shrub	Ornament, #barrier	Asia	1919 (PRE)	Transformer	159	84	1.893	4A
**Pyracantha crenulata*	Rosaceae	Woody tree/ shrub	Ornament, #barrier	Asia	1918 (PRE)	Invasive, potential transformer	25	84	0.300	4A
**Quercus robur*	*Fagaceae	Woody tree/ shrub	#Ornament, agricultural crop	Europe & Asia	1656 (Geldenhuys *et al.* 1986)	Invasive, potential transformer	50	347	0.144	3
**Robinia pseudoacacia*	Fabaceae	Woody tree/ shrub	Ornament, #cover/binder, barrier, agricultural crop (honey)	N America	1858 (McGibbon 1858)	Transformer	110	145	0.759	4B
**Rosa multiflora*	Rosaceae	Woody tree/ shrub	#Ornament, barrier	Asia	1945 (PRE)	Naturalized, potential transformer	5	58	0.086	6A
**Rosa rubiginosa*	Rosaceae	Woody tree/ shrub	#Ornament, barrier, agricultural crop	Asia	1937 (PRE)	Transformer	120	66	1.818	4A
Rubus cuneifolius	Rosaceae	Woody tree/ shrub	Agricultural crop	N America	1898 (Phillips *et al.* 1939)	Transformer	75	105	0.714	6A
Rubus flagellaris	Rosaceae	Woody tree/ shrub	?Agricultural crop	N America	1981 (PRE)	Invasive, potential transformer	4	22	0.182	3
Rubus fruticosus	Rosaceae	Woody tree/ shrub	Agricultural crop	Europe	1858 (McGibbon 1858)	Transformer	89	145	0.614	3
Salix babylonica	Salicaceae	Woody tree/ shrub	Ornament, #cover/binder, agricultural crop	Asia	1679–1699 (Smith 1966)	Transformer	476	324	1.469	4B
Salix fragilis	Salicaceae	Woody tree/ shrub	Ornament, #cover/binder, ?agricultural crop	Asia	1914 (PRE)	Transformer	75	89	0.843	4A
Salsola tragus (in part misapplied as *S. kali*)	Chenopodiaceae	Herb	None	Europe & Asia	1899–1902 (Henderson & Anderson 1966)	Ruderal weed & potential transformer	157	104	1.510	1
Sorghum halepense	Poaceae	Grass	Agricultural crop	Mediterranean	1894 (Medley-Wood 1894)	Agrestal, ruderal & special effect weed	45	109	0.413	7B

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 2.—Northern temperate species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Spartium junceum*	Fabaceae	Woody tree/ shrub	#Ornament, barrier	Europe	1858 (McGibbon 1858)	Invasive, potential transformer	20	145	0.138	2A
Tamarix chinensis	Tamaricaceae	Woody tree/ shrub	#?Ornament, cover/binder, agricultural crop (honey)	Asia	1858 (McGibbon 1858)	Invasive, potential transformer	4	145	0.028	1
Tamarix ramosissima	Tamaricaceae	Woody tree/ shrub	#?Ornament, cover/binder, agricultural crop (honey)	Europe & Asia	1923 (PRE)	Invasive, potential transformer	7	80	0.088	1
**Ulex europaeus*	Fabaceae	Woody tree/ shrub	#Ornament, barrier, agricultural crop (honey)	Europe	1858 (McGibbon 1858)	Invasive, potential transformer	9	145	0.062	4A

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 3.—Tropical species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Achyranthes aspera*	Amaranthaceae	Herb	None	Africa	<1652 (Wells *et al.* 1986)	Invasive, special effect weed	78	>350	0.223	6B
**Agave americana*	*Agavaceae	Succulent tree/shrub	Ornament, #barrier, agricultural crop	America	1858 (McGibbon 1858)	Naturalized, special effect weed	433	145	2.986	7B
**Agave sisalana*	*Agavaceae	Succulent tree/shrub	Barrier, #agricultural crop, ornament	America	1929 (Smith 1929)	Naturalized, potential transformer	171	74	2.311	6B
**Ageratina adenophora*	Asteraceae	Herb	Ornament	America	1958 (PRE)	Invasive, potential transformer	11	45	0.244	6B
**Ageratina riparia*	Asteraceae	Herb	Ornament	America	<1980s (PRE)	Invasive, special effect weed	1	23	0.043	6B
**Ageratum conyzoides*	Asteraceae	Herb	Ornament	America	1894 (Medley Wood 1894)	Invasive, special effect weed	41	109	0.376	6B
**Ageratum houstonianum*	Asteraceae	Herb	Ornament	America	1858 (McGibbon 1858)	Invasive, special effect weed	26	145	0.179	6B
Albizia lebbeck	Fabaceae	Woody tree/shrub	Ornament	Asia	1905 (Sim 1905)	Transformer	6	98	0.061	5
Albizia procera	Fabaceae	Woody tree/shrub	Ornament	Asia	1885 (Sim 1905)	Transformer	1 u	118	0.008	5
**Alpinia zerumbet*	Zingiberaceae	Herb	Ornament	Asia	1909 (PRE)	Naturalized, potential transformer	5	94	0.053	6B
**Anredera cordifolia*	Basellaceae	Climber	Ornament	America	1894 (PRE)	Invasive, potential transformer	25	109	0.229	6B
**Antigonon leptopus*	Polygonaceae	Climber	Ornament	America	1927 (Cran 1927)	Invasive, special effect weed	5	76	0.066	5
**Araujia sericifera*	Asclepiadaceae	Climber	Ornament	America	1918 (PRE)	Invasive, special effect weed	37	85	0.435	6B
**Ardisia crenata*	Myrsinaceae	Woody tree/shrub	Ornament	Asia	1955 (PRE)	Invasive, potential transformer	2 u	48	0.042	5
**Argemone mexicana*	*Papaveraceae	Herb	None	America	1894 (Medley Wood 1894)	Agrestal, ruderal & special effect weed	34	109	0.312	5
**Argemone ochroleuca*	*Papaveraceae	Herb	None	America	1885 (PRE)	Agrestal, ruderal & special effect weed	161	118	1.364	7B
Aristolochia elegans	Aristolochiaceae	Climber	Ornament	America	1914 (PRE)	Invasive, special effect weed	6	89	0.067	6A
Azolla filiculoides	Azollaceae	Aquatic	Ornament	America	1948 (Oosthuizen & Walters 1961)	Transformer	243	55	4.418	4B

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 3.—Tropical species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
Bauhinia purpurea	Fabaceae	Woody tree/ shrub	Ornament	Asia	1858 (McGibbon 1858)	Invasive, special effect weed	1 u	145	0.007	6A
Bauhinia variegata	Fabaceae	Woody tree/ shrub	Ornament	Asia	1891 (PRE)	Invasive, special effect weed	9 u	112	0.080	6A
**Bryophyllum delagoense*	Crassulaceae	Herb	Ornament	Madagas-car	1939 (PRE)	Invasive, special effect weed	8	64	0.125	6A
Caesalpinia decapetala	Fabaceae	Climber	#Barrier, ornament	Asia	1858 (McGibbon 1858)	Transformer	128	145	0.883	5
**Campuloclinium macrocephalum*	Asteraceae	Herb	Ornament	America	1962 (PRE)	Transformer	38	41	0.927	4A
**Canna indica*	*Cannaceae	Herb	Ornament	America	<1800 (Wells *et al.* 1986)	Naturalized, potential transformer	27	>200	0.135	6B
**Canna ×generalis*	*Cannaceae	Herb	Ornament	America	1964 (PRE)	Naturalized, potential transformer	9	39	0.231	6B
Cardiospermum grandiflorum	Sapindaceae	Climber	Ornament	America	1912 (PRE)	Transformer	48	91	0.527	6A
Cardiospermum halicacabum	Sapindaceae	Climber	Ornament	America	1858 (McGibbon 1858)	Naturalized, minor weed	31	145	0.214	6A
**Casuarina cunninghamiana*	*Casuarinaceae	Woody tree/ shrub	Ornament, cover/ binder, #barrier	Australia	1903 (PRE)	Invasive, potential transformer	10	100	0.100	6B
**Casuarina equisetifolia*	*Casuarinaceae	Woody tree/ shrub	Ornament, #cover/ binder, barrier	Pantropical	1858 (McGibbon 1858)	Invasive, potential transformer	23	145	0.159	5
**Catharanthus roseus*	Apocynaceae	Herb	#Ornament, agri-cultural crop (me-dicinal)	Madagas-car	< 1652 (Wells *et al.* 1986)	Invasive, special effect weed	41	>350	0.117	6A
**Cereus jamacaru*	Cactaceae	Succulent tree/shrub	#Ornament, barrier	America	1925 (PRE)	Transformer	136	78	1.744	7A
**Cestrum aurantiacum*	Solanaceae	Woody tree/ shrub	#Ornament, barrier	America	1850–1900 (Wells *et al.* 1986)	Invasive, special effect weed	9	153	0.059	6B
**Cestrum elegans*	Solanaceae	Woody tree/ shrub	#Ornament, barrier	America	? early 1900s	Invasive, special effect weed	3	100	0.030	5
**Cestrum laevigatum*	Solanaceae	Woody tree/ shrub	#Ornament, barrier	America	1892 (PRE)	Transformer	73	111	0.658	6B
**Cestrum parqui*	Solanaceae	Woody tree/ shrub	#Ornament, barrier	America	1927 (PRE)	Transformer	1	76	0.013	4A
**Chromolaena odorata*	Asteraceae	Woody tree/ shrub	Ornament	America	1858 (McGibbon 1858)	Transformer	99	145	0.683	5
**Cortaderia jubata*	Poaceae	Grass	#Ornament, cover/ binder	America	1958 (PRE)	Invasive, potential transformer	9	45	0.200	4A

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 3.—Tropical species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
Cuscuta suaveolens	Convolvulaceae	Climber	None	America	1894 (Medley Wood 1894)	Invasive, special effect weed	7	109	0.064	7B
**Datura ferox*	Solanaceae	Herb	None	America	1908 (PRE)	Agrestal, ruderal & special effect weed	190	95	2.000	7B
**Datura inoxia*	Solanaceae	Herb	None	America	1886 (PRE)	Agrestal, ruderal & special effect weed	56	117	0.479	7B
**Datura stramonium*	Solanaceae	Herb	#agricultural crop (medicinal)	America	1650–1799 (Wells *et al.* 1986)	Agrestal, ruderal & special effect weed	299	353	0.847	7B
**Duranta erecta*	Verbenaceae	Woody tree/ shrub	#Ornament, barrier	America	1858 (McGibbon 1858)	Invasive, special effect weed	34	145	0.234	6A
Eichhornia crassipes	Pontederiaceae	Aquatic	Ornament	America	1884 (Stirton 1978)	Transformer	99	119	0.832	6B
**Eucalyptus camaldulensis*	Myrtaceae	Woody tree/ shrub	#Silvicultural crop, barrier, ornament, agricultural crop (honey)	Australia	1896 (Poynton 1959) ?1884 (Storr Lister 1884 as *E. rostrata*)	Transformer	127	107	1.187	7B
**Eucalyptus grandis*	Myrtaceae	Woody tree/ shrub	#Silvicultural crop, barrier, ornament, agricultural crop (honey)	Australia	1885 (Poynton 1959)	Transformer	103	118	0.873	6A
Eugenia uniflora	Myrtaceae	Woody tree/ shrub	#Ornament, barrier, agricultural crop	America	1834 (Bradlow 1965)	Invasive, potential transformer	4	169	0.024	5
**Harrisia martinii*	Cactaceae	Succulent tree/shrub	Ornament	America	?early 1900s (De Beer & Zimmermann 1986)	Transformer	21	100	0.210	6A
Ipomoea alba	Convolvulaceae	Climber	Ornament	America	1858 (McGibbon 1858)	Transformer	23	145	0.159	6A
Ipomoea carnea subsp. *fistulosa*	Convolvulaceae	Woody tree/ shrub	Ornament, #barrier	America	1953 (PRE)	Invasive, special effect weed	23	50	0.460	6A
Ipomoea indica	Convolvulaceae	Climber	Ornament	America	1890 (PRE)	Transformer	23 u	113	0.204	6B
Ipomoea purpurea	Convolvulaceae	Climber	Ornament	America	1830 (PRE literature)	Invasive, special effect weed	41 u	173	0.237	6A
**Jacaranda mimosifolia*	Bignoniaceae	Woody tree/ shrub	Ornament	America	1830s (Bradlow 1965)	Transformer	203	173	1.173	6A
Lantana camara	Verbenaceae	Woody tree/ shrub	#Ornament, barrier	America	1858 (McGibbon 1858)	Transformer	268	145	1.848	6B
**Leucaena leucocephala*	Fabaceae	Woody tree/ shrub	#Agricultural crop, cover/binder, ornament	America	1850–1900 (Wells *et al.* 1986)	Invasive, potential transformer	39	153	0.255	6A

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 3.—Tropical species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Litsea glutinosa*	Lauraceae	Woody tree/ shrub	Ornament	Asia	1902–1903 (Sim 1905)	Transformer	8	100	0.080	5
**Macfadyena unguis-cati*	Bignoniaceae	Climber	#Ornament, barrier	America	1927 (Cran 1927)	Transformer	32	76	0.421	6A
**Melia azedarach*	Meliaceae	Woody tree/ shrub	Ornament	Australasia	1800 (Smith 1966)	Transformer	561	203	2.764	6B
**Mimosa pigra*	Fabaceae	Woody tree/ shrub	Ornament	America	1954 (PRE)	Invasive, potential transformer	7	49	0.143	6A
**Montanoa hibiscifolia*	Asteraceae	Woody tree/ shrub	Ornament	America	1910 (PRE)	Invasive, special effect weed	24	93	0.258	5
**Myriophyllum aquaticum*	Haloragaceae	Aquatic	Ornament	America	1921 (PRE)	Transformer	49	82	0.598	6B
Nephrolepis exaltata	Davalliaceae	Herb	Ornament	America	?early 1900s	Transformer	14 u	100	0.140	6B
**Nicotiana glauca*	Solanaceae	Woody tree/ shrub	Ornament	America	1830s (Bradlow 1965)	Ruderal & special effect weed	399	173	2.306	7B
**Oenothera jamesii*	Onagraceae	Herb	Ornament	America	1858 (McGibbon 1858)	Invasive, potential transformer	16 u	145	0.110	4A
**Oenothera rosea*	Onagraceae	Herb	Ornament	America	1858 (McGibbon 1858)	Invasive, potential transformer	4 u	145	0.028	4A
**Opuntia exaltata*	Cactaceae	Succulent tree/shrub	#Ornament, barrier	America	1936 (PRE)	Invasive, potential transformer	6	67	0.090	4A
**Opuntia ficus-indica*	Cactaceae	Succulent tree/shrub	Barrier, #agricultural crop	America	?1656 (Wells *et al.* 1986)	Transformer	868	347	2.501	7B
**Opuntia imbricata*	Cactaceae	Succulent tree/shrub	Ornament	America	1913 (PRE)	Transformer	135	90	1.500	7A
**Opuntia monacantha*	Cactaceae	Succulent tree/shrub	#Agricultural crop, barrier	America	1772 (Neser & Annecke 1973)	Invasive but minor weed	48	231	0.208	6B
**Opuntia spinulifera*	Cactaceae	Succulent tree/shrub	#Ornament, barrier	America	1934 (PRE)	Invasive, potential transformer	9	69	0.130	4A
**Opuntia stricta*	Cactaceae	Succulent tree/shrub	Ornament	America	1937 (PRE)	Transformer	115	66	1.742	7A
Parkinsonia aculeata	Fabaceae	Woody tree/ shrub	Ornament	America	1858 (McGibbon 1858)	Invasive, potential transformer	16	145	0.110	7A
**Parthenium hysterophorus*	Asteraceae	Herb	None	America	1894 (Medley Wood 1894)	Invasive, special effect weed	25	109	0.229	6A
**Passiflora caerulea*	Passifloraceae	Climber	Ornament	America	1858 (McGibbon 1858)	Invasive, special effect weed	12	145	0.083	3
**Passiflora edulis*	Passifloraceae	Climber	Ornament, #agricultural crop	America	1858 (McGibbon 1858)	Invasive, special effect weed	36	145	0.248	6B

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 3.—Tropical species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Passiflora suberosa*	Passifloraceae	Climber	Ornament	America	1858 (McGibbon 1858)	Invasive, special effect weed	6	145	0.041	6A
**Passiflora subpeltata*	Passifloraceae	Climber	Ornament	America	1858 (McGibbon 1858)	Invasive, special effect weed	21	145	0.145	6A
**Passiflora tripartita* var. *mollissima* (= *P. mollissima*)	Passifloraceae	Climber	Ornament, #agricultural crop	America	1951 (PRE)	Invasive, potential transformer	4	52	0.077	3
Pennisetum clandestinum	Poaceae	Grass	#Cover/binder, agricultural crop	Africa	1915 (PRE)	Invasive, potential transformer	50	88	0.568	3
Pennisetum purpureum	Poaceae	Grass	Barrier, #agricultural crop, ornament	Africa	1930 (PRE literature)	Transformer	42	73	0.575	6A
Pennisetum setaceum	Poaceae	Grass	#Ornament, cover/binder	Africa	1936 (PRE)	Invasive, special effect weed	69	67	1.030	7B
Pennisetum villosum	Poaceae	Grass	Ornament, #?cover/binder	Africa	1917 (PRE)	Invasive, special effect weed	22	86	0.256	4B
**Pereskia aculeata*	Cactaceae	Climber	#Barrier, ornament	America	1858 (McGibbon 1858)	Transformer	21	145	0.145	6B
Phytolacca dioica	Phytolaccaceae	Woody tree/shrub	Ornament	America	1858 (McGibbon 1858)	Invasive, special effect weed	30	145	0.207	3
**Pinus patula*	*Pinaceae	Woody tree/shrub	#Silvicultural crop, barrier, ornament	America	1907 (Poynton 1959)	Transformer	90	96	0.938	6A
**Pistia stratiotes*	Araceae	Aquatic	Ornament	America	1894 (Medley Wood 1894)	Transformer	29	109	0.266	6B
Plectranthus comosus	Lamiaceae	Woody tree/shrub	Ornament	Asia	1947 (PRE)	Invasive, special effect weed	17	56	0.304	6B
**Pontederia cordata*	Pontederiaceae	Aquatic	Ornament	America	1945 (PRE)	Invasive, special effect weed	7	58	0.121	6A
**Psidium cattleianum*	Myrtaceae	Woody tree/shrub	#Ornament, agricultural crop	America	1948 (PRE)	Invasive, potential transformer	5	55	0.091	5
**Psidium guajava*	Myrtaceae	Woody tree/shrub	#Agricultural crop, ornament	America	1700s (Wells *et al.* 1986)	Transformer	168	300	0.560	6B
**Psidium guineense*	Myrtaceae	Woody tree/shrub	Ornament	America	?early 1900s	Invasive, special effect weed	2	100	0.020	5
**Pueraria montana* var. *lobata* (= *P. lobata*)	Fabaceae	Climber	Ornament, #cover/binder, agricultural crop	Asia	1946 (PRE)	Invasive, potential transformer	6	57	0.105	6A
**Ricinus communis*	Euphorbiaceae	Woody tree/shrub	#Agricultural crop (medicinal), ornament	Africa	± 800 (Brink 1988)	Invasive, special effect weed	472	>1200	0.393	6B

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 3.—Tropical species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
**Rivina humilis*	Phytolaccaceae	Herb	Ornament	America	1944 (PRE)	Invasive, special effect weed	7	59	0.119	6A
**Salvinia molesta*	Salviniaceae	Aquatic	Ornament	America	1961 (Wild 1961)	Transformer	44	42	1.048	6B
**Schinus molle*	Anacardiaceae	Woody tree/ shrub	#Ornament, barrier	America	1883 (PRE)	Invasive, special effect weed	232	120	1.933	7A
**Schinus terebinthifolius*	Anacardiaceae	Woody tree/ shrub	Ornament, #barrier	America	1926 (PRE)	Invasive, potential transformer	32	77	0.416	5
Senna bicapsularis	Fabaceae	Climber	#Ornament, barrier	America	1858 (McGibbon 1858)	Invasive, potential transformer	17	145	0.117	5
Senna corymbosa	Fabaceae	Woody tree/ shrub	#Ornament, barrier	America	1858 (McGibbon 1858)	Invasive, special effect weed	5	145	0.034	6A
Senna didymobotrya	Fabaceae	Woody tree/ shrub	Ornament, #barrier	Africa	1909 (PRE)	Invasive, special effect weed	143	94	1.521	6A
Senna hirsuta	Fabaceae	Woody tree/ shrub	Ornament	America	1850–1900 (Wells *et al.* 1986)	Invasive, special effect weed	9	153	0.059	5
Senna mutliglandulosa	Fabaceae	Woody tree/ shrub	Ornament	America	1898 (PRE)	Invasive, special effect weed	11	105	0.105	3
Senna occidentalis	Fabaceae	Woody tree/ shrub	Ornament, #?agricultural crop (coffee; medicinal)	America	1858 (McGibbon 1858)	Ruderal & special effect weed	56	145	0.386	6A
Senna pendula var. *glabrata*	Fabaceae	Climber	Ornament	America	1933 (PRE)	Invasive, potential transformer	19	70	0.271	5
Senna septemtrionalis	Fabaceae	Woody tree/ shrub	Ornament	America	1909 (PRE)	Invasive, special effect weed	64	94	0.681	6A
Sesbania punicea	Fabaceae	Woody tree/ shrub	Ornament	America	1858 (McGibbon 1858)	Transformer	326	145	2.248	3
Solanum mauritianum	Solanaceae	Woody tree/ shrub	Ornament	America	1862 (PRE)	Transformer	270	141	1.915	3
Solanum seaforthianum	Solanaceae	Climber	Ornament	America	1902 (PRE)	Invasive, special effect weed	35	101	0.347	6A
Solanum sisymbriifolium	Solanaceae	Woody tree/ shrub	None	America	1906 (PRE)	Ruderal, agrestal & minor weed	43	97	0.443	6B
* *Sphagneticola trilobata* (= *Thelechitonia trilobata*)	Asteraceae	Herb	#Ornament, cover/ binder	America	1979 (PRE)	Ruderal weed & transformer	5	24	0.208	5
Syzygium cumini	Myrtaceae	Woody tree/ shrub	#Ornament, agricultural crop	Asia	1917 (PRE)	Invasive, potential transformer	11	86	0.128	5

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

APPENDIX 3.—Tropical species: summary of information. Quarter-degree squares (QDS) were obtained from SAPIA database (cont.)

Scientific name	Family	Growth form	Cultivated use	Origin	Earliest date	Weed status	QDS	No. years up to 2003	Rate of spread (QDS/no. years)	Distrib. zone
Syzygium jambos	Myrtaceae	Woody tree/ shrub	#Ornament, agricultural crop	Asia	1858 (McGibbon 1858)	Invasive, potential transformer	3	145	0.021	6B
Tecoma stans	Bignoniaceae	Woody tree/ shrub	#Ornament, barrier	America	1858 (McGibbon 1858)	Invasive, potential transformer	66	145	0.455	6A
**Thevetia peruviana*	Apocynaceae	Woody tree/ shrub	Ornament	America	?1858 (McGibbon 1858)	Invasive, special effect weed	15	145	0.103	5
**Tipuana tipu*	Fabaceae	Woody tree/ shrub	Ornament	America	1916 (PRE)	Invasive, potential transformer	26	87	0.299	6A
**Tithonia diversifolia*	Asteraceae	Woody tree/ shrub	Ornament	America	?early 1900s	Invasive, special effect weed	52	100	0.520	6B
**Tithonia rotundifolia*	Asteraceae	Woody tree/ shrub	#Ornament, agricultural crop (honey)	America	?early 1900s	Invasive, special effect weed	23	100	0.230	6A
**Toona ciliata*	Meliaceae	Woody tree/ shrub	#Ornament, silvicultural crop	Australasia	1902 (PRE)	Invasive, potential transformer	30	101	0.297	5
**Toxicodendron succedaneum* (= *Rhus succedanea*)	Anacardiaceae	Woody tree/ shrub	Ornament	Asia	1932 (PRE)	Invasive, special effect weed	12	71	0.169	5
**Triplaris americana*	Polygonaceae	Woody tree/ shrub	Ornament	America	?1970s (PRE literature)	Invasive, potential transformer	3	30	0.100	5
**Xanthium spinosum*	Asteraceae	Herb	None	America	1650–1799 (Wells *et al.* 1986)	Ruderal & special effect weed	85	353	0.241	7B
**Xanthium strumarium*	Asteraceae	Herb	None	America	1893 (PRE)	Ruderal & special effect weed	152	110	1.382	7B

*Alien genera and families not indigenous in southern Africa; PRE, Pretoria National Herbarium; u, underestimated; #, primary use.

Bothalia 36,2: 223–242 (2006)

South African National Biodiversity Institute: administration and research staff 31 March 2006, publications 1 April 2005–31 March 2006

Compiler: B.A. Momberg

CHIEF DIRECTORATE (ADIR)

CAPE TOWN—PEARSON HOUSE

Huntley, Prof. B.J. M.Sc. Chief Executive Officer
Laidler, Mrs S.A. B.Sc.(Agric.)(Hons). Senior Provisioning Admin. Officer. Personal Assistant
Finca, Ms N.F. Specialist Cleaner

PRETORIA

Mabeba, Ms K.L. B.A.(Hons). Secretary to SANBI Board

WORKING FOR WETLANDS PROJECT (EDIR/WF)

Dini, J.A. B.Sc.(Hons). Programme Manager. Pretoria (contract worker)

Beetge, A. N.Dip.(Forestry). Regional Co-ordinator. Mpumalanga (contract worker)
Buckle, J.D. B.Sc.(Hons). Technical Advisor, Southern region. Port Elizabeth (contract worker)
Goge, M.C. M.Sc. (Environmental Science). Provincial Coordinator, KwaZulu Natal (contract worker)
Mangqalaza, Ms S.M. M.Ed. Social Development & Training Co-ordinator. Pretoria (contract worker)
Manyeza, Ms I.M. Provisioning Admin. Officer (contract worker)
Mokhutsane, T.J. Regional Co-ordinator, Limpopo. Pretoria (contract worker)
Mukhoro, M. B.Sc.(Hons)(Environm.Managem.). Project Manager, National Wetland Inventory (contract worker)
Munzhedzi, T.E. B.A.(Ed.). Regional Co-ordinator, North-West and Free State. Rustenburg (contract worker)

GLOBAL INVASIVE SPECIES PROGRAMME (GISP)

CAPE TOWN

Jackson, Ms L.F. Ph.D. Director (contract worker)
Barnard, Ms P.E. Ph.D. Senior Specialist Scientist. Working Group Co-ordinator/Scientific and Technical Co-ordinator (contract worker)
Matthews, Ms S.G. Communications Co-ordinator (contract worker)
Whiting, Ms D.M. Senior Administrator (contract worker)

MARKETING AND COMMUNICATION DIRECTORATE (AMAR)

PRETORIA

Director: vacant
Liebenberg, Mrs E.J.L. M.Sc. Control Agricultural Technician. Acting Manager (North)

CAPE TOWN

Van Aswegen, Ms C.E. HED, B.A.(History & Psych.). Principal Communications Officer. Admin. support

HUMAN RESOURCES DIRECTORATE (APER)

PRETORIA

Netshiombo. M.J. B.Admin.(Hons), DPLR(UNISA), AHR(UNISA). Chief Director

Baloyi, Ms I. N.Dip.(Manag. Assist.). Senior Secretary IV
Leboho, Ms N. B.Com.(Human Res.), Dip.(Personnel Manag.), Dip.(Public Rela.). Senior Personnel Practitioner
Mokale, Ms M.C. Clerk (contract worker)

CAPE TOWN

Kriel, Mrs G.A. Dip.(Sec.). Senior Secretary IV
Haupt, Mrs C.S. Specialist Cleaner. Guest house
Karlie, Ms F. Cleaner I

PERSONNEL—CAPE TOWN

Engelbrecht, B. N.Dip.(Hort.), N.Dip.(PRM), Dip.(Forestry). Deputy Director: Human resources management and health & safety co-ordination
Staal, P.B. Dip.(Soc. Sci.), Cert.Indust. Relations. Assistant Director. Labour & staff relations

Claassen, Ms G.E. Senior Telkom Operator III. Admin. Support, front line duties
Crowie, A.C. Senior Registry Clerk II
Dollie, Mrs N.J. Specialist Cleaner
Du Toit, Ms R. HED. Assistant Director. Training and development
Fredericks, C.H. Driver II. Courier services
Nicholas, Mrs W.L. Senior Photocopy Machine Operator
Oosthuizen, Ms G. Senior Provisioning Admin. Clerk III. Recruitment Clerk
Petersen, R.E. Senior Personnel Practitioner. Employment equity
Sass, Ms D. Senior Provisioning Admin. Clerk II. Leave & IOD admin.

FINANCE DIRECTORATE (AFIN)

PRETORIA

Singh, S.. B.Com.(Hons). Chief Director. Finance
Matsie, T.J. B.Com.(Hons). Deputy Director. Financial management

CAPE TOWN

Rawoot, N.A. B.Acc.Sc. Deputy Director: Financial management
Maholwana, S. B.Com.(Hons). Assistant Director. Asset management
Neuwirth, Ms E.V. B.Com.(Hons). Assistant Director: Employee salaries & benefits and Principal Officer: Retirement Fund
Van Zyl, J.M. M.Econ.(Indust. Psych.). Assistant Director: Organizational Development & Training

Bean, Ms S.E. Dip.(Human Res.). Project Admin. (contract worker)
Cassiem, Ms S. Chief Accounting Clerk. Salaries
Cooper, S.K. Senior Accounting Clerk II. Creditors
Goodman, Mrs I.W. State Accountant. Supervisor: Creditors
Jacobs, F.H. Senior Accounting Clerk II. Staff benefits
Jacobs, Ms S. Dip.(Finan.Managem.). Assistant Director. Financial management: general ledger
Mcontsi, Ms N. N.Dip.(Acc.). Senior Accounting Clerk III. Creditors
Paulse, Mrs D.W.S. Dip.(Bookkeep.), Dip.(Sec.). Chief Accounting Clerk III. Creditors
Potgieter, Ms G. Salaries Clerk (contract worker)

ENVIRONMENTAL EDUCATION DIRECTORATE (EDIR, EENT/GP)

PRETORIA

Qwathekana, Ms N.M. B.A.(Hons), B.A.(Eng., Geog. & Film Studies III), Dip. (Ed.), M.Phil.(Geog. & Envir. Sci.) Director
Mpungose, J.E. B.Paed., B.A.(Hons) (Geog.), Advanced Postgrad.Cert.(Ed. Mngt.), M.Phil. (Geog.). Assistant Director: Environm. Ed. Co-ordinator

Canham, B.J. B.A.(Sociol. & Eng.). Programme Manager. Greening of the Nation (contract worker)
Eyssell, Ms A. B.Sc.(Hons)(Hort.). Senior Environm. Ed. Officer. Outreach Horticulturist
Kutumela, M.S. (student)
Mahasha, Ms P.M. N.T.C.III(Hort.). (student)
Maphuta, Mrs M.S. Specialist Cleaner, Assistant to centre manager
Maseola, C.G. N.Dip.(Nat.Cons.) (contract worker)
Mashiyi, G. B.Com. Admin./Finance Officer. Greening the Nation (contract worker)
Mathaba, T.C. Environm. Ed. Officer
Novellie, Mrs E. HED, B.Sc.(Hons)(Zoo. & Mammology). Principal Environm. Ed. Officer
Pillay, Ms R. Senior Provisioning Admin. Officer
Ramabulane, S.A. N.T.C.III(Hort.). (student)
Sikhauli, Ms N. B.Sc. (student)

CAPE TOWN

Belle, E. (student)
Dlamini, Ms N. (student)
Motsoko, Ms N. (student)
Nketu, M.J. (student)

EASTERN CAPE

Mchunu, Ms E.N. B.A. Project Officer. Butterworth (contract worker)
Mpongwana, Ms S.N. B.Bib. Project officer. Cradock (contract worker)
Zondani, V. B.A.(Hons). Regional Co-ordinator: Greening of the Nation (contract worker)

WESTERN CAPE (EECT/C)

Coe, W.F. Regional Co-ordinator (contract worker)
Katise, Ms T.C. (student)
Van Dayar, Ms M.M. HED IV (contract worker)

GOLDFIELDS CENTRE—CAPE TOWN (EECT)

Fullard, D. B.Sc.Ed., B.Ed.(Hons). Deputy Director. Environm. Ed. Co-ordinator

Boyana (Magija), Ms N.F. N.Dip.(Hort.), B.Tech.(Environm. Managem.). Senior Environm. Ed. Officer. Outreach greening
Ellman, Ms R.S. HED, B.Sc. Senior Environm. Ed. Officer. Resource development
Hey, Ms S.J. HED, B.A.(Geog.). Senior Environm. Ed. Officer. Garden-based programme
Matthews, M.Z. Specialist groundsman. Outreach greening
Mgodeli, W.M. Driver II
Mjuleni, Ms L.M. N.Dip.(Hort.). Outreach greening (student)
Mswazi, M.Q. B.Soc. (student)
September, Ms M. Senior Provisioning Admin. Clerk II. Admin. support

HAROLD PORTER NBG—BETTY'S BAY

Xaba, P.A. N.Dip.(Hort.). Senior Environmental Education Officer. Overberg Useful Plants Project (YARP/CF) (contract worker)
Williams, Ms L. N.Dip.(Nature Cons.) (student)

LOWVELD NBG—NELSPRUIT (EENT/MP)

Mamatsharaga, L.A. M.Sc.(Ed.). Assistant Director: Environm. Ed.

Hlalu, Ms X. N.Dip.(Hort.). Outreach Horticulturist (contract worker)
Matshaya, Ms N.N. N.Dip.(Hort.) (student)
Mavimbela, Ms S.W. (student)
Nyathi, Ms G.S. N.Dip.(Pers.Assist.). Senior Provisioning Admin. Clerk II
Randima, Ms G.D. Specialist Cleaner

FREE STATE NBG—BLOEMFONTEIN (EENT/FS)

Moletsane, M.E. B.Ed.(Hons). Principal Environm. Ed. Officer. Admin. support
Ngena, Ms K.M.G. Provisioning Admin. Clerk I
Phangoa, M.P. (student)
Tshabalala, Ms B.N.W. (student)

WALTER SISULU NBG—ROODEPOORT (EENT/GW)

Konanani, L.N. (student)
Kondlo, Ms M. N.Dip.(Hort.), Advanced Cert.Environm.Ed. Outreach Horticulturist
Molefe, Ms K.E. Dip.(Nature Cons.). Senior Environm. Ed. Officer. Outreach education
Moore, Mrs J.M. N.H.Dip.(Sec.). Senior Provisioning Admin. Clerk II. Admin. support
Vatsha, M.L. B.A., HED. Principal Environm. Ed. Officer

BIODIVERSITY PROGRAMMES, POLICY AND PLANNING DIRECTORATE (DBIO)

PRETORIA

Maze, Ms K.E. M.Sc. Director. Biodiversity policy and planning
Matlala, Ms J. Senior Administrative Officer

BIOREGIONAL POLICY AND MONITORING UNIT—PRETORIA (DBIO/DD)

Driver, Ms A.L. M.A., M.B.A. Deputy Director. Bioregional policy and monitoring
Smith, Ms T.J. Ph.D. Bioregional Policy and Products Officer

BIODIVERSITY, KRC—CAPE TOWN (DBIO/C)

Roberts, R. B.Sc.(Hons). Chief Information Technology Advisor (contract worker)
Rogers, Ms I.M. Supervisor: data ecoding and georeferencing (contract worker)

BIODIVERSITY PLANNING—PRETORIA (DBIO/PL)

Rouget, M.J.F. Ph.D. Biodiversity Planning Manager. Alien plant invasions, conservation planningJonas, Ms Z.R. M.Sc.(Conserv. & GIS). Conservation Planner (Cape Town)

Mohamed, Ms B.M. B.Sc.(Hons). TSP GIS Specialist
Wistebaar, Ms N.P. B.Sc.(Hons). (student)
Tshitangano, N.F. B.Sc. (student)

EASTERN CAPE CO-ORDINATION UNIT—PORT ELIZABETH (DBIO/EC)

Cadman, M.J. Ph.D. Bioregional Programmes Co-ordinator: Eastern Cape (contract worker)

Cumming, T.L.C. B.Sc.(Hons). Project Developer (contract worker)
Hartmann, N.R. B.Sc.(Hons)(GIS). Intern Project Officer (contract worker)
Myles, Ms M.L. B.A. Senior Administrative Officer (contract worker)

BIODIVERSITY GIS (BGIS)—CAPE TOWN

Willoughby, S.W. M.A.(Geogr. Sci.). Biodiversity GIS Project Manager (contract worker)

Cocks, M. M.Sc.(Bot.).Web Developer (contract worker)
Khatieb, Ms S. B.Sc.(Hons). GIS Technician (contract worker)
Potgieter-Haung, Ms W. Financial Admin.

THREATENED SPECIES PROGRAMME—PRETORIA (YDBR/TS)

Foden, Ms W.B. M.Sc.(Cons. Biol.). Programme Manager (contract worker)

Naidoo, Ms K. B.Sc.(Hons). Red List Officer (contract worker)
Potter, Ms L. M.Sc.(Cons.Biol.). Red List Officer (contract worker)
Rigala, Ms Z.C. N.Dip.(Hort.). Data Encoder (contract worker)
Victor, Ms J.E. M.Sc.(Plant Syst.), H.Dip.(Journ.). Control Agricultural Scientist. Red List Scientist. Taxonomy of Rutaceae, Asclepiadaceae

CUSTODIANS OF RARE AND ENDANGERED WILD FLOWERS (CREW) THREATENED PLANT PROJECT

Raimondo, Ms D.C. M.Sc. (Cons. Biol.). National Programme Manager (Pretoria)

Ebrahim, I. N.Dip.(Hort.). Fynbos Programme Manager (Cape Town)
Jacobs, L.E.O. Data Encoder. Cape Town (contract worker)
Von Witt, Ms C.G. Project Co-ordinator: Cape Floristic Region (contract worker)

SUCCULENT KAROO ECOSYSTEM PROGRAMME (SKEP)—CAPE TOWN (YDBR/SK)

Henderson, O.C. Programme Manager

Hartney, Ms D.J. B.A.(Hons)(Envir. & Geogr. Sci.) Programme Developer (contract worker)
Mathys, Ms C.N.Dip.(Journ.).Communications Intern (contract worker)
Williams, Mrs B. Dip.(Admin.). Programme Administrator (contract worker)

NATIONAL GRASSLANDS BIODIVERSITY PROGRAMME—PRETORIA (YDBR/GG)

Nazare, Ms F.C. M.Sc. Programme Co-ordinator (contract worker)

CAPE ACTION PLAN FOR PEOPLE (CAPE) PROJECT

CAPE TOWN

Sandwith, T. Programme Co-ordinator (contract worker)

Barnett, M. Ph.D. Programme Developer (contract worker)
Madaka, R. eForum Library Intern (contract worker based at UCT)

Court, Ms S.J. N.Dip.(Computer Admin.). Finance and Procurement Manager (contract worker)
Damons, Ms M.H. B.A.(Dev. & Env.). Project Development Intern (contract worker)
Parker, Mrs A. B.A.(Hons). Project Developer (contract worker)

GARDENS DIRECTORATE—ADMIN STAFF (GDIR)

PRETORIA

Willis, C.K. M.Sc.(Cons. Biol.). Chief Director: Gardens and Horticultural Services

Bagus, Mrs J. N.Dip.(Account.). Senior State Accountant. Poverty Relief Projects
Heilgendorff, J.P. N.H.Dip.(Hort.). Gardens IT Manager
Els, Ms L. N.Dip.(Sec.). Senior Secretary IV

CAPE FLATS NATURE PROJECT—CAPE TOWN (YAPR/CF)

Goldman, Ms T. B.Soc.Sci.(Hons). Project Manager (contract worker)

Hathorn, Ms P.M. B.A.(Hons), N.Dip.(Hort.). Capacity building Manager (contract worker)
Martin, Ms M. Cert.Masters Business Serv.(CMBS). Admin. Co-ordinator (contract worker)

URBAN CONSERVATION—CAPE TOWN (GDIR/UC)

Davis, G.W. Ph.D. Deputy Director: Communication. Project management and fund raising

Peter, L.M. Dip.(Hort.). Principal Communications Officer. Communications Manager. Edith Stevens Reserve
Phoswayo, Ms V. Senior Provisioning Admin. Clerk II. Admin. support

INTERPRETATION (GINN)

Roff, J. Cert.Envir.Interpr. & Ed. Communication Officer. Interpretation (Pietermaritzburg)

BUILDING PLANNING, MAINTENANCE & DEVELOPMENT—CAPE TOWN (BPMD)

Linde, D.C. N.T.C.III(Civil & Structural: Building), N.T.C.III (Inspector of Works: Building), M.S.A.I.D, Cert. Estate Agency. Control Works Inspector
Abrahams, P. Handyman. Building maintenance
Manasse, S.P. Dip.(Masonry). Artisan Foreman. Building maintenance
Peck, W.I. Senior Handyman. Building maintenance
Tomlinson E.C. Handyman. Building maintenance

CURATORS

Behr, Ms C.M. Curator: Pretoria NBGBritz, R.M. Curator: Lowveld NBG (Nelspruit)
Gavhi, M.P. Curator: Free State NBG (Bloemfontein)
Le Roux, P.H. Deputy Director. Curator: Kirstenbosch NBG (Cape Town)
Oliver, I.B. Curator: Karoo Desert NBG (Worcester)
Tarr, B.B. Curator: Natal NBG (Pietermaritzburg)
Willcock (née Turner), Mrs S.L. Curator: Walter Sisulu NBG (Roodepoort/Mogale City)
Xaba, Ms A.C. Curator: Harold Porter NBG (Betty's Bay)

HAROLD PORTER NBG—BETTY'S BAY (GHPG)

Xaba, Ms A.C. N.Dip.(Hort.). Control Agricultural Technician. Curator

Abrahamse, F. Senior Foreman. Estate maintenance and development
Arendse, L.P. Auxiliary Services Officer II. Access control
Arendse, Ms M. Auxiliary Services Officer II. Access control
Bebe, Ms N. Cleaner I
Bezuidenhout, Mrs H.M. Chief Provisioning Admin. Officer
Carolus, Ms B.J. B.Tech.(Hort.). Chief Agricultural Development Technician. Horticulture
Forrester, Ms J.A. N.T.C.III(Hort.). Chief Agricultural Development Technician. Horticulture
Julies, C.A. Provisioning Admin. Clerk
October, Ms R.P. Dip.(Ed.). Senior Auxiliary Services Officer. Plant records and admin. support
Smith, E.J. Foreman. General Garden Maintenance
Van Wyk, Ms I. (student)
Van Wyk, A.B. Artisan. General maintenance

KAROO DESERT NBG—WORCESTER (GKAR)

Oliver, I.B. N.Dip.(Hort.), N.Dip.(Parks Recrea. & Admin), N.Parks Dip. (Parks Recrea. & Management). Control Agricultural Technician. Curator

Harris, Ms S. N.Dip.(Hort). Senior Agricultural Development Technician. Scientific collections
Kwayimani, P. N.Dip.(Hort.). Senior Agricultural Development Technician. Garden management
Makubalo, F.N. Principal Foreman. Nursery
Mpeke, Ms E.N. Specialist Cleaner
Salonika, Ms A.S.D. Senior Provisioning Admin. Clerk III. Admin. support
Sibozo, N.E. Driver II. Plant sales
Simani, D.K. Principal Foreman. Plant collections
Viljoen, D.M. N.Dip.(Hort.). Chief Agricultural Development Technician. Records Officer

KIRSTENBOSCH NBG—CAPE TOWN (GKBC)

Le Roux, P.H. Dip.(Forestry), N.Dip.(Hort.), N.Dip.(Parks & Recr.), Cert.Turf Management. Deputy Director: Garden Management. Curator

Adams, T.D. B.Tech.(Hort.). Senior Agricultural Development Technician. Supervisor: Greenhouse
Hitchcock, A.N. N.H.Dip.(Hort.). Control Agricultural Development Technician. Nursery Manager
Morkel, A.T. N.Dip.(Nature Cons.). Control Agricultural Development Technician. Estate Manager
Notten, Ms A.L. B.Sc., N.Dip.(Hort.). Chief Agricultural Development Technician. Interpretive Officer
Trautman, C.E. Artisan. Supervisor: Workshop

Adonis, A. Principal Foreman. Dell & ericas
Adonis, S.J. Senior Foreman. Alien vegetation control
Arends, Ms S.J. Principal Auxiliary Services Officer. Plant records
Barnes, M. (student)
Bowler, M. Principal Foreman. Annuals
Brown, B.M. N.Dip.(Hort.). Agricultural Development Technician. Seed room
Crowie, R.W. Principal Foreman. General garden
De Abreu, Ms P. (student)
Emms, P. Kirstenbosch Scholar 2006 (contract worker)
Duncan, G.D. M.Sc., N.Dip.(Hort.). Control Agricultural Development Technician. Bulbs, systematics of *Lachenalia*
Engelbrecht, F. Senior Provisioning Admin. Clerk II. Stores
Engelbrecht, Mrs L.D. Control Auxiliary Services Officer. Plant records
Fani, L.B. (student)
Grace, T. Senior Provisioning Admin. Clerk III. Stores & admin. support
Harrower, A.D. B.Sc.(Bot. & Zoo.) Ball Agreement. Project Manager
Hope, C.F. Senior Handyman. Construction
Jacobs, H.C. Principal Foreman. Plant production
Jansen, K. Principal Foreman. Drivers
Jodamus, Ms N.L. N.Dip.(Hort.). Chief Agricultural Development Technician. Annuals, Rutaceae, alpines and Cape endemics
Kamalie, Ms S. Senior Typist. Receptionist
Kayster, G.J. Principal Foreman. Construction
Kuscus, G.W. Principal Foreman. General maintenance
Lusithi, Ms X. (student)
Mathys, Mrs S.S.B. Senior Accounting Clerk III. Revenue and garden statistics
Matthews, I.N. Principal Foreman. Estate & trails
Mbambezeli, N.G. N.Dip.(Hort). Agricultural Development Technician. Trees & shrubs
Mitchells, G. Control Specialist Groundsman. Senior Foreman. Casual staff projects
Morris, J.N.M. Senior Foreman. Proteas
Newman, W. Artisan. Mechanical workshop
Oliver, R.C. N.Dip.(Hort.). Senior Specialist Groundsman. Nursery (student)
Picane, Ms S. Auxiliary Services Officer II. Tissue culture
Prins, F.B. Security Officer III
Rudolph, A. Security Officer III
Shanks, G.R. Ball Agreement. Glass House Assistant (contract worker)
Smith, Mrs A. Senior Provisioning Admin. Clerk II. Admin. support
Solomons, T.C. Senior Security Officer II
Tamboer, J.S. Principal Foreman. Nursery services
Twine, Ms M. Chief Agricultural Development Technician. Proteas & restios
Van Gusling, E.J. Principal Foreman. Mowers
Van der Walt, Mrs L.E. N.Dip.(Hort.). Chief Agricultural Development Technician. Herbaceous collections
Van Jaarsveld, E.J. M.Sc., N.Dip.(Hort.). Control Agricultural Technician. Succulents
Van Wyk, F. Principal Auxiliary Services Officer II. Lable Maker
Viljoen, Ms C.C. N.Dip.(Hort.). Chief Agricultural Development Technician. Plant production
Voigt, W.E. N.Dip.(Hort.). Chief Agricultural Development Technician. Dell
Wall, Ms K.E. (student)

VISITORS CENTRE—CAPE TOWN (GKBC/VC)

Struys, Ms S. B.A.(Hons)(Directing), Postgrad.Dip.(Market. Manag.). Assistant Director: Communication. Events & Centre Manager

Fredericks, Ms N.C.E. Senior Auxiliary Services Officer. Visitors' Centre. Information services
Jacobs, A.P. Chief Auxiliary Services Officer. Visitors' Centre. Information services

Malan, Ms C.E. B.Sc.(Hons). Principal Communication Officer: Tour co-ordinator
Pekeur, Ms A. Senior Provisioning Administration Clerk II: Events Co-ordinator
Phillips, R. Senior Provisioning Admin. Clerk. Facilities Officer
Williams, G.C. Senior Auxiliary Services Officer. Information

LOWVELD NBG—NELSPRUIT (GLOW)

Britz, R.M. N.Dip.(Forestry). Control Agricultural Technican. Curator

Froneman, W.C.F. N.T.C.III(Hort.), N.Dip.(Nature Cons. & Man.), N.Dip.(Parks & Rec. Admin.), N.T.C.III(Hort.). Control Agricultural Technician. Nursery management & garden development
Hurter, P.J.H. B.Sc.(Hons). Control Agricultural Technician. Garden Manager. Cycad conservation
Le Roux, Ms L. N.H.Dip.(Nature Cons.). Chief Auxiliary Services Officer II. Interpretation
Maqungo, Ms V.L.B. Auxiliary Services Officer. Front line Officer
Mathebula, Ms I.N. Senior Auxiliary Services Officer. Front line Officer
Mathebula, Ms N.R. Senior Accounting Clerk I. Admin. Support
Mlombo, Ms T.C. Foreman. Garden
Mukoma, T. Dip.(Hort.), B.Tech.(Agric. Managem.), B.Tech.(Hort.). Agricultural Development Technician. Horticulturist
Ndlovu, L.D. Senior Foreman. Handyman
Ngwenya, P.S. Senior Auxiliary Services Officer II. Kiosk
Shongwe, V.P. Foreman. Garden
Sibanyoni, Ms S.M. Cleaner II
Van der Walt, Mrs G.A.M. Chief Provisioning Admin. Clerk
Xozumti, M.M. Principal Foreman. Supervisor. Garden

KWAZULU-NATAL NBG—PIETERMARITZBURG (GKZN)

Tarr, B.B. N.Dip.(Parks & Rec. Admin.), Advanced Dip.(Adult Educ.). Control Agricultural Technician. Curator

Dlungwane, T.R. Principal Foreman. Garden maintenance
Johnson, Ms I. HED, M.Sc. Control Agricultural Development Technician
Ngiba, S.E. (student)
Nonjinge, S.H.B. N.T.C.III(Hort.). Chief Agricultural Development Technician
Sibiya, Ms C.P.T. Cleaner II
Van der Merwe, Mrs M.E.H. Senior Provisioning Admin. Clerk III
Zimu, M.J. Principal Foreman. Garden

FREE STATE NBG—BLOEMFONTEIN (GFSG)

Gavhi, M.P. N.Dip.(Hort.). Control Agricultural Technician. Curator

Barnard, Ms A.D. Senior Provisioning Admin. Clerk III (part time)
Katise, Ms T.C. (student)
Lepitla, M.H. Senior Foreman. Garden
Mankazana, Ms N. (student)
May, T.S. Foreman. Garden
Ngalo, M.S. Senior Auxiliary Services Officer. Interpretation
Nyuleka, Ms N.A. Senior Accounting Clerk I
Raditlhare, Mrs E.M. Cleaner II
Rambuwani, L.D. N.Dip.(Hort.). Senior Agricultural Development Technician. Nursery
Sebolai, R.P.A.N. Senior Handyman. General maintenance

PRETORIA NBG (GPTA)

Behr, Ms C.M. B.Sc.(Hons). Control Agricultural Development Technician. Curator

Baloyi, K.J. Senior Auxiliary Services Officer II. Information Officer. Garden records
Baloyi, M.S. Dip.(IBM), Dip.(PTM), Dip.(Payroll Admin.). Senior Provisioning Admin. Clerk I. Leave records and H.R. support
Bell, Ms F.C. HED, N.Dip.(Hort.). Chief Agricultural Development Technician.
Creighton, Ms D.D. Senior Provisioning Admin. Clerk III. Admin. support
Difoloko, J.A. Dip.(Ed.), N.Dip.(Hort.). Senior Agricultural Development Technician.
Ferreira, Ms L. B.A.(Fine Art), N.Dip.(Nature Cons.). Chief Auxiliary Services Officer. Information
Keyter, B.A. Senior Security Officer II
Kutama, B.T. Principal Foreman. Garden: hard landscape development and maintenance
Lithudza, E.F. Dip.(Hort.). Chief Agricultural Development Technician
Mabapa, K.I. Cleaner II
Mahange, M.J. B.Tech.(Public Managem. & Admin.). Senior Provisioning Admin. Officer
Makgobola, Ms M.R. Auxiliary Services Officer II. Reception & admin. Support
Mahlangu, J.F. Senior Foreman. Garden: machine operators and irrigation
Mahlangu, R.E. Cert.(Office Admin.), Cert.(Plater.). Senior Artisan. Workshop and general maintenance
Mangoale, F.L. Artisan. Building construction development and maintenance
Masimula, Ms B.M. Specialist Groundsman.
Mkhasibe, Mrs N.S. Dip.(Office Admin.). Senior Provisioning Admin. Clerk I. Leave records and H.R. support

Modisha, M.D. Cleaner II
Naidoo, D.A. N.Dip.(Hort.), Dip.(Fund & Managem.). Control Agricultural Development Technician.
Ngcobo, Ms B.P. (student)
Schiel, A. Cert.(Plater). Artisan. Building construction development and maintenance
Sibiya, Ms T.R. Cleaner II
Singh, Mrs R. Senior Provisioning Admin. Clerk III. Admin. support
Solomons, Ms C.V. Principal Auxiliary Services Officer. Plant records clerk

WALTER SISULU NBG—ROODEPOORT (GSIS)

Willcock (née Turner), Mrs S.L. B.Sc.(Hons), N.Dip.(Hort.). Control Agricultural Technician. Curator

Aubrey, Mrs A.E. B.Tech.(Hort.). Chief Agricultural Development Technician. Plant records, interpretation, information (part time)
Baloyi, S.J. Handyman. Stores
Dlamini, M.D. N.Dip.(Hort.). Senior Agricultural Development Technician. Garden, nursery
Hankey, A.J. N.Dip.(Hort.), B.Tech.(Hort.). Control Agricultural Development Technician. Garden, estate, collections, nursery
Head, Mrs S.E. Dip.(Shorthand & Typing). Provisioning Admin. Officer
Mabela, H.L. (horticultural student)
Mamosebo, M.A. Factotum
Manyikana, T.M. Factotum
Mmola, Mrs B.E. Cleaner II
Mtsweni, P. N.Dip.(Hort.). Senior Agricultural Development Technician. Support services, estate
Ndou, A.P. Senior Auxiliary Services Officer II. Information services
Ndzondo, Ms N.L. Senior Provisioning Admin. Clerk I
Ndzondo, Mrs P.G. Cleaner II
Nedambale, M.P. Senior Foreman. Garden
Nemalili, M.E. Senior Foreman. Machines and vehicles
Nenungwi, M.S. Senior Foreman. Nursery
Tiro, D.W. Senior Accounting Clerk II

RESEARCH DIRECTORATE (RDIR)

PRETORIA

Smith, Prof. G.F. Ph.D., F.L.S. Chief Director: Research & Scientific Services
Marais, Mrs A.C. Senior Provisioning Admin. Officer. Personal Assistant

Arnold, T.H. Head: Data Management (Pretoria)
Crouch, Prof. N.R. Head: Ethnobotany Unit (Durban)
Donaldson, Dr J.S. Director: Kirstenbosch Research Centre (Cape Town)
Koekemoer, Dr M. Curator: National Herbarium (Pretoria)
Leistner, O.A. D.Sc. F.L.S. Agricultural Scientist (contract worker)
Meyer, Mrs N.L. B.Sc.(Hons). Agricultural Development Technician (contract worker)
Roux, Dr J.P. Curator: Compton Herbarium (Cape Town)
Singh, Ms Y. Curator: Natal Herbarium (Durban)
Steenkamp, Ms Y. Assistant Director: SABONET Regional Project Co-ordinator (Pretoria)
Wolfson, Dr M.M. Director: Research Support Services

KWAZULU-NATAL HERBARIUM—DURBAN (RHED)

Singh, Ms Y. HED, M.Sc. Control Agricultural Development Technician. Taxonomy of Araceae, Hypoxidaceae. Curator

Apollos, Mrs C.E. Senior Provisioning Admin. Clerk II. Marketing
Glen, H.F. Ph.D. Specialist Scientist. Taxonomy of trees, cultivated plants; botanical history
Glen, Mrs R.P. M.Sc. Control Agricultural Technician. Wetland plants of southern Africa
Hlongwane, Mrs N.C. Cleaner II & messenger
Keswa, V. B.Sc. Field worker. Zulu Botanical Knowledge Project (contract worker)
Magubane, M.M. Dip.(Agric.). Field work Supervisor. Zulu Botanical Knowledge Project (contract worker)
Ngwenya, M.A. Senior Agricultural Development Technician. Herbarium Officer. Plant identification and information, Zulu Botanical Knowledge Project
Mazibuko, J.V.G. Senior Auxiliary Services Officer. Herbarium Assistant
Noble, Mrs H-E. Chief Provisioning Admin. Clerk III
Parbhoo, Ms S. B.Sc.(Microbiol.). Data capturer (contract worker)

ETHNOBOTANY UNIT—DURBAN (RETH)

Crouch, Prof. N.R. Ph.D. Deputy Director. Ethnobotany of southern African flora, bioprospecting
Douwes, E. B.Sc.(Hons). (student)

NATIONAL HERBARIUM—PRETORIA (RHEN)

Koekemoer, Ms M. Ph.D. Deputy Director. Herbarium management. Taxonomy of Asteraceae: Gnaphalieae

Bredenkamp, Mrs C.L. Ph.D. Control Agricultural Scientist. Assistant Curator: Public relations. Taxonomy of *Vitex*, *Passerina,* Malvaceae, Sterculiaceae, and other related families

Fish, Mrs L. B.Sc. Principal Agricultural Scientist. Assistant Curator: Collections Manager. Taxonomy of Poaceae

Herman, P.P.J. M.Sc. Principal Agricultural Scientist. Assistant Curator: Personnel. Taxonomy of Asteraceae

Mothogoane, M.S. Chief Auxiliary Services Officer. Assistant Curator: Herbarium assistants. Wing C

Sebothoma, P.N. Cert.Sec. Principal Auxiliary Services Officer. Assistant Curator: Service room. Plant identifications co-ordinator

Van Rooy, J. Ph.D. Control Agricultural Scientist. Assistant Curator: Technical staff. Taxonomy and biogeography of mosses

Anderson, J.M. Ph.D. Specialist Scientist. Molteno Palaeoflora, Gondwana Alive

Archer Mrs C. M.Sc. Principal Agricultural Scientist. Taxonomy of Cyperaceae, monocotyledons (general)

Archer, R.H. Ph.D. Principal Agricultural Scientist. Taxonomy of mainly Celastraceae, Euphorbiaceae

Bester, S.P. M.Sc. Senior Agricultural Scientist. Taxonomy of Apocynaceae, Ericaceae, Rutaceae

Burgoyne, Ms P.M. M.Sc. Control Agricultural Scientist. Mesembryanthemaceae and Crassulaceae

Götzel, Ms A. Senior Provisioning Admin. Clerk III

Govender, Ms M. B.Sc. Senior Agricultural Development Technician. Curation and plant ID in Wing C

Jordaan, Mrs M. M.Sc. Principal Agricultural Scientist. Taxonomy of Celastraceae: Celastroideae, interactive key to the trees of southern Africa

Kgaditsi, T.W. Senior Auxiliary Services Officer. Specimen mounter, general assistant

Klopper, Ms R.R. M.Sc. Senior Agricultural Scientist. Pteridophyta and selected monocotyledonous families

Makgakga, M.C. B.Sc. Agricultural Development Technician. Curation and plant ID in Wing B

Makgakga, K.S. Principal Auxiliary Services Officer. Herbarium Assistant. Encoding plant specimens, data capturing, labels typist, curation of Wing D

Makholela, Ms T.M. Ph.D. Principal Agricultural Scientist. Taxonomy of Acanthaceae and Rubiaceae

Maserumule, M.K. Principal Auxiliary Services Officer. Curation of Wing B

Masombuka, Ms A.S. N.Dip.(Nature Cons.). Principal Auxiliary Services Officer. Herbarium Assistant. Curation of Wing A

Meyer, J.J. HED. Chief Agricultural Development Technician. Bioprospecting Project

Mothapo, M.A. H.Cert.Off.Admin.(DMS). Principal Auxiliary Services Officer. Label typist

Mpongo, T. B.Sc. Senior Agricultural Development Technician. Curation and plant ID in Wing A

Nkoane, Ms G.K. Principal Auxiliary Services Officer. Loans, exchanges, gifts, parcelling, stores

Phahla, T.J. Senior Auxiliary Services Officer. Specimen mounter of cryptogams, packer, general assistance

Phephu, Ms N. B.Sc. Agricultural Development Technician. Mosses (contract worker)

Ready, Mrs J.A. N.Dip.(Hort.). Principal Auxiliary Services Officer. Plant identifications, *Helichrysum*. Curation of Wing D

Retief, Ms E. Ph.D. Principal Agricultural Scientist. Taxonomy of Boraginaceae, Verbenaceae, Lamiaceae, Asteraceae, Rubiaceae, Geraniaceae, Oxalidaceae, Vitaceae

Smithies, Mrs S.J. M.Sc., Dip.Ed.(Moray House). Chief Agricultural Development Technician. Taxonomy of Scrophulariaceae *sens. lat.*, Pedaliaceae, Bignoniaceae, Lentibulariaceae, Gesneriaceae, Martyniaceae, Orobanchaceae

Steyn, Ms C.C. Principal Auxiliary Services Officer. Scientific support

Swelankomo, Ms N. B.Sc.(Hons). Senior Agricultural Development Technician. Curation and plant ID in Wing D

Welman, Ms W.G. M.Sc. Principal Agricultural Scientist. Taxonomy of Convolvulaceae, Solanaceae, Cucurbitaceae, Asteraceae: Senecioneae, Acanthaceae

Winter, P.J.D. M.Sc. Principal Agricultural Scientist. Taxonomy of mainly Apiaceae

AFRICAN PLANTS INITIATIVE [API] (CEPF)

PRETORIA

Rampho, Ms E.T. B.Sc. Chief Agricultural Development Technician. Project Co-ordinator (RHEN)

Chiliza, S.B. Senior Herbarium Assistant (contract worker)

Grunyuza, Ms T. N.Dip.(Fine Art). Senior Herbarium Assistant (contract worker)

Khumalo, Ms A.N. Senior Herbarium Assistant (contract worker)

Madlala, E.N. Senior Herbarium Assistant (contract worker)

Mashua, Ms T.J. (student)

Mnengwane, Ms J.J.J. Senior Herbarium Technician (contract worker)

Moeaha, Ms M.J. Senior Herbarium Technician. Poaceae Project (contract worker)

Mudau, Ms A.C. Senior Herbarium Technician. Poaceae Project (contract worker)
Nembudani, M.T. B.Sc. Senior Herbarium Technician. Poaceae Project (contract worker)
Nthungeni, N. Senior Herbarium Assistant (contract worker)
Tshidada, Ms N.J. B.Sc. Senior Herbarium Assistant (contract worker)

COMPTON HERBARIUM—CAPE TOWN

Arendse, S. M.Sc. Project Co-ordinator (contract worker)
Davids, Ms N. Data Capturer (contract worker)
Smith, Ms M. Data Capturer (contract worker)
Mannie, Ms L. M.Sc. (contract worker)
Vlotman, Ms L.R. Data Capturer (contract worker)
Williams, Mrs V.J. Dip.(Ed.). Data Capturer (contract worker)

DURBAN

Majola, S.B. Data Capturer (contract worker)
Marimuthoo, Ms D. Data Capturer (contract worker)

DATA MANAGEMENT—PRETORIA (RPDC)

Arnold, T.H. M.Sc. Principal Data Technologist. Assistant Director. Computer database application especially in taxonomy

Boman, Ms M.J. PRECIS data typist
Botha, Mrs A.G. Chief Auxiliary Services Officer. Administrative Assistant
De Wet, Mrs B.C. B.Sc.(Comp. Sci.), B.A., H.D.L.S. Principal Agricultural Datametrician. Chief PRECIS programmer (contract worker)
Mashilo, M.B. B.Sc.(Info.Technol.), IT Support Officer: API medicinal plants (contract worker)
Montshonyane, Ms E.M. Senior Herbarium Assistant: API medicinal plants (contract worker)
Mostert (née Joubert), Mrs R.E. B.Sc.(Hons). Agricultural Scientist. PRECIS Information Officer
Mphephu, T.A. Scientific Officer (contract worker)
Sachse, Ms B. B.Sc.(Hons). Medicinal Plants Project (contract worker)
Snyman, Mrs E.E. B.Sc. N.Dip.(Comp. Data Proc.). Senior Agricultural Development Technician. PRECIS Information Officer
Steenkamp, Ms Y. M.Sc. Principal Agricultural Scientist. PRECIS Information Co-ordinator
Steyn, Ms H.M. Senior Agricultural Scientist. PRECIS Information Officer

RESEARCH SUPPORT SERVICES—PRETORIA (EDIR)

Wolfson, Mrs M.M. Ph.D. Director. HDE Policy and Legislation related to Access and Benefit-sharing, Bioprospecting and Intellectual Property

Liebenberg, Mrs E.J.L. Head: Research Support Services, Publications
Naicker, K. Head: Admin. and OHASA
Potgieter, Mrs E. Principal Librarian
Ramatlo, Ms N. N.Dip.(Sec.). Senior Secretary IV
Van Wyk, E. Project manager, Millenium Seed Bank Project

ADMINISTRATION AND OHASA—PRETORIA (RPTA)

Naicker, K. Dip.(Bookkeep.), Cert.(Sales & Market. Managem.), H.Cert.(Prac. Accounting), H.Dip.(Business Managem.), Dip.(Professional Business Communic.). Assistant Director

Adams, Ms E.M. Cert.IBMDisk.Op. Senior Provisioning Admin. Officer.
Thibela, A. Dip.(Road Transport). Senior Foreman. Supervisor: Cleaning services
Bosheilo, M.S. Cleaner II
Khumalo, N.P. Cert.Labour Rela. Senior Registry Clerk II
Malefo, R.P. Cleaner II
Marule, P.M. Artisan. General maintenance
Neveling, Mrs V.H. Chief Accounting Clerk
Nkosi, Mrs M.P. Specialist Cleaner
Phaahla, M.C. Cleaner II
Ramsey, Y.K. Handyman. General maintenance
Tloubatla, J.M. Driver II. Courier services
Thobakgale, Ms N.R. N.Dip.(Comp. Sci.). Sen. Telekom Operator I. Receptionist. Herbarium Building

PUBLICATIONS—PRETORIA (RPUB)

Liebenberg, Mrs E.J.L. M.Sc. Control Agricultural Technician. Cytotaxonomy. Manager

Condy, Ms G.S. M.A. Chief Industrial Technician. Botanical artist
Du Plessis, Mrs E. B.Sc.(Hons), S.E.D. Chief Language Practitioner. Technical editor. Editing, translating, layout

Germishuizen, G. M.Sc. Assistant Director. Scientific Editor
Mapheza, T.P. Senior Provisioning Admin. Clerk III. Bookshop Manager
Momberg, Mrs B.A. B.Sc.(Entomol. & Zoo.). Principal Language Practitioner. Technical editor. Editing, layout (part time)
Maree, Ms D.J. HED. Senior Computer Operator.
Sithole, A.M. Provisioning Admin. Clerk II. Bookstore
Turck, Mrs S. B.A.(Information Design). Control Industrial Technician. Graphic design

MARY GUNN LIBRARY—PRETORIA (RLBP)

Potgieter, Ms E. B.Libr. Principal Librarian

Fourie, Mrs A. H.Dip.(Libr.Sci.). Principal Librarian (part time)
Moseki, Ms M. Library Assistant
Shipalana, Ms K.M. N.Dip.(Libr. Info. Studies). Senior Library Assistant II

MILLENNIUM SEED BANK PROJECT

PRETORIA (YRDR/MS)

Van Wyk, E. M.Sc.(Plant Ecol.). Principal Agricultural Scientist. Project manager

Mabatha, F.W. B.Envir.Sc. Chief Auxiliary Services Officer. Project Assistant (contract worker)
Nkuna, L.A. B.Envir.Sc. Senior Agricultural Development Technician. Pretoria Collecting Team Co-ordinator (contract worker)

KIRSTENBOSCH (YKBG/MS)

Cowell, Ms C.R. B.Tech.(Hort.). Senior Agricultural Development Technician. Cape Collecting Team Co-ordinator (contract worker)
Nurrish, Ms L.M. B.Tech.(Hort.). Auxiliary Services Officer. Project Assistant (contract worker)
Pekeur, Ms O.R. N.Dip.Nature Cons.). Chief Auxiliary Services Officer. Project Assistant (contract worker)

KIRSTENBOSCH RESEARCH CENTRE (RREL)

CAPE TOWN

Donaldson, J.S. Ph.D.(Zoo.). Director
Morkel, Ms L. N.Dip.(Office Admin.). Senior Secretary IV. Personal Assistant to Director

COMPTON HERBARIUM—CAPE TOWN (RHEC)

Roux, J.P. N.T.C.III(Hort.), F.L.S., Ph.D. Deputy Director. Collections Manager. Systematics of Pteridophyta
Manning, J.C. Ph.D. Senior Specialist Scientist. Research Leader, Systematics. Systematics of Iridaceae and Hyacinthaceae; anatomy

Cupido, C.N. M.Sc. Principal Scientist. Systematics of Campanulaceae (Campanuloideae)
Cupido, Ms C.S. Senior Auxiliary Services Officer II. Technical Assistant
Foster, Mrs S.E. Senior Secretary IV
Krige, Ms A. Research Intern (contract worker)
Leith, Mrs J. Cert.Primary Sch.Teacher. Senior Provisioning Admin. Clerk III
Marinus, Ms E.D.A. Dip.(Ed.). Control Auxiliary Services Officer. Herbarium Assistant
Ngcakana, S.G. Dip.(Ecol.) (student)
Parker-Allie, Ms F. M.Sc. Senior Agricultural Scientist. Taxonomy of Thymelaeaceae
Paterson-Jones, D.A. (née Snijman) Ph.D. U.E.D. Specialist Scientist. Systematics of Amaryllidaceae and Hypoxidaceae; flora of the Succulent Karoo region
Von Wit, Ms C.G. Threatened Species Programme. Project Assistant (contract worker)

GLOBAL CHANGE

Midgley, G.F. Ph.D. Chief Specialist Scientist. Plant ecophysiology, stress ecology, modelling

Arnolds, Ms J.L. Chief Auxiliary Services Officer
Kgope, B.S. M.Sc. Principal Agricultural Scientist. Plant ecophysiology
Mantlana, K.B. Principal Agricultural Scientist. Plant ecophysiology
Musil, C.F. Ph.D. Senior Specialist Scientist. Ecophysiology, modelling
Parker-Allie, F. M.Sc. Senior Scientist. Invasion biology, modelling
Snyders, S.G. Principal Auxiliary Services Officer II. Greenhouse, maintenance
Thuiller, W. Post doctoral scientist. Niche-based modelling, climate impacts modelling
De Witt, D.M. Chief Auxiliary Services Officer. Scientific research assistant

CONSERVATION BIOLOGY

Donaldson, J.S. Ph.D.(Zoo.). Cycad biology

Bösenberg, J. de Wet. B.Sc.(Hons). Chief Agricultural Development Technician. Cycad biology, Pollination Project
Ebrahim, I. N.Dip.(Hort.). Custodians of Rare and Endangered Wildflowers Programme (CREW). Co-ordinator (contract worker)
Mills, A.J. Ph.D.(Soil Sci.). Post doctoral fellow
Marinus, E.M. N.Cert.(Building & Structures). Chief Auxilliary Services Officer. Conservation farming
Nänni, Ms I. HED, B.Sc. Control Agricultural Development Technician. Project Co-ordinator
Petersen, Ms A. B.Sc.(Hons). Senior Agricultural Development Technician. Land use and vegetation mapping

LANDSCAPE ECOLOGY

Rutherford, M.C. Ph.D., Dip.(Datamet.). Chief Specialist Scientist. Modelling, global change

Daniels, Ms F. B.Sc.(Hons)(Bot. & Plant Ecol.). Threatened species research (contract worker)
Parenzee, Ms H.A. Dip.(Ed.). Senior Provisioning Admin. Clerk III
Powrie, L.W. M.Sc. Chief Information Technology Advisor. Spatial modelling, databases
Rebelo, A.G. Ph.D.(Zoo.). Control Agricultural Scientist. Protea Atlas Project

HARRY MOLTENO LIBRARY (RRLC)

Reynolds, Ms P.Y. B.Bib.(Hons), M.A.(Info. Sci.), B.Proc., Dip.(Datamet.). Chief Librarian. SANBI Website Manager

Ntsham, Ms N.L. B.Bibl. Library/website Assistant (contract worker)
Jagger, B.W. B.A.(Soc. Sci.), PGDip.Lis. Senior Librarian

SANBI WEBSITES (AMWS)

Reynolds, Ms P.Y. B.Bib.(Hons), M.A.(Info. Sci.), B.Proc., Dip.(Datamet.). Website Manager

LESLIE HILL MOLECULAR SYSTEMATICS LABORATORY

Tolley, K.A. Ph.D. Research Leader

Rossouw, Ms L. B.Sc.(Hons). Scientific Officer. DNA laboratory manager and DNA bank manager
Conrad, Ms F. M.Sc. Principal Agricultural Scientist. Molecular systematics
Houniet, D.T. DNA lab. intern (contract worker)
Khunou, Ms A. Agricultural Scientist. AFLP Manager
Mabunda, Ms M.A. B.Sc.(Hons). NBI Masters student. DNA barcoding (contract worker)
Reeves, Ms G. Ph.D. Senior Agricultural Scientist (contract worker)

INFORMATION TECHNOLOGY (RRIT)

CAPE TOWN

Evans, N. Chief Information Technology Officer. Network Controller.
Pekeur, Ms B.L. Chief Provisioning Admin. Clerk. IT support

PRETORIA

Smit, G.C. A+ (CTU), NT Workstation 4, NT Server 4. Chief Network Controller

SUPPORT SERVICES

Bardien-Overmeyer, Ms S. B.A.(Pharm.). Principal State Admin. Officer. Admin. Manager

Anderson, D.L. Artisan
Boonzaaier, I. Specialist Groundsman. Maintenance
Bowler, Mrs M. Admin. Aid II. Cleaner. Assistant: teas and functions
De Witt, D.M. Senior Artisan (B-Group). Maintenance

AFFILIATIONS

WORLD CONSERVATION UNION (IUCN) SPECIES SURVIVAL COMMISSION (SSC)—CAPE TOWN

Dublin, Ms H. Ph.D.(Zool.). Chairman. African Elephant Specialist Group, IUCN governance, Red List process, strategic planning, fundraising
Poole, Mrs C. M.Phil.(Environm. Managem.). Personal Assistant (contract worker)

AGRICULTURAL RESEARCH COUNCIL, PLANT PROTECTION RESEARCH INSTITUTE—PRETORIA

Henderson, Ms L. B.Sc.(Hons). Principal Researcher. Invasive alien plants. Project Manager of Southern African Plant Invaders Atlas (SAPIA)

NETCB SOLUTIONS

Els, Ms F. MCSE, A+, N+, Dip.(Comput.Engin.). Technical Support Officer
Modukanele, A.N. N.Cert.(Info. & Communic.), N+, Cert.Novell & Linux Sales

PUBLICATIONS BY THE STAFF

1 April 2005–31 March 2006

ADAMS, T. 2005-07. *Freylinia densiflora* Benth. (Scrophulariaceae). Internet 2 pp. http://www.plantzafrica.com/plantefg/freylindens.htm.

ADAMS, T. 2005-08. *Freylinia helmei* Van Jaarsv. (Scrophulariaceae). Internet 2 pp. http://www.plantzafrica.com/plantefg/freylinhelm.htm.

ADAMS, T. 2005-10. *Pelargonium peltatum* (L.) L'Hér. (Geraniaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/pelargpelt.htm.

ADAMS, T. 2005-11. *Pelargonium capitatum* (L.) L'Hér. (Geraniaceae). Internet 2 pp. http://www.plantzafrica.com/plantnop/pelargcapit.htm.

ANDERSON, J.M. 2005. Abstract: A brief history of gymnosperms: diversity trends. XVII International Botanical Congress, Vienna, Austria, 17–23 July 2005: 68.

ARAÚJO, M.B., PEARSON, R.G., THUILLER, W. & ERHARD, M. 2005. Validation of species climate impact models under climate change. *Global Change Biology* 11: 1504–1513.

ARCHER, C. 2005-08. Family Cyperaceae. Internet 4 pp. http://www.plantzafrica.com/plantcd/cyperaceae.htm.

ARCHER, C. & CONDY, G. (Artist). 2005a. *Habenaria bicolor* and *H. kraenzliniana*. *Flowering Plants of Africa* 59: 52–59, t. 2208, 2209.

ARCHER, C. & CONDY, G. (Artist). 2005b. *Satyrium sphaerocarpum*. *Flowering Plants of Africa* 59: 68–73, t. 2211.

ARCHER, R.H. & ARCHER, C. 2005-07. *Brunsvigia radulosa* Herb. (Amaryllidaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/brunsvigrad.htm.

ARCHER, R.H. & JORDAAN, M. 2005. *Salix*: the correct application of the name *Salix mucronata*, and a new combination (Salicaceae). *Bothalia* 35: 92.

ARNOLD, T.H. & STEYN, H.M. 2005. *PRECIS.pc National Herbarium, Pretoria (PRE) Computerised Information System Specimen database user guide*. Southern African Botanical Diversity Network Report No. 39. SABONET, Pretoria.

AUBREY, A. 2005-05. *Rhus leptodictya* Diels. (Anacardiaceae). Internet 4 pp. http://www.plantzafrica.com/plantqrs/rhuslepto.htm.

BARNARD, P. & JACKSON, L. 2005. Invasive alien species—coping with aliens: invasive species—a global issue, with global solutions. In *Proceedings of Biodiversity Loss and Species Extinctions: Managing risk in a changing world, a Global Synthesis Workshop convened at the IUCN World Conservation Forum, 18–20 November, 2004, Bangkok, Thailand*. CD publication.

BARNARD, P., MIDGLEY, G. & THUILLER, W. 2005. Invasive species under global change—signs from a homogenized world. *GISPNews—Newsletter of the Global Invasive Species Programme* 4: 8–11.

BARRACLOUGH, T.G. & REEVES, G. 2005. The causes of speciation in flowering plant lineages: species-level DNA trees in the African genus *Protea*. In F.T. Bakker, L.W. Chatrou, B. Gravendeel & P.B. Pelser, *Plant species-level systematics: new perspectives on pattern and process*: 30–45. Gantner Verlag, Ruggell, Liechtenstein.

BALOYI, J.K. with additions by REYNOLDS, Y. 2005-11. *Rothmannia globosa* (Hochst.) Keay (Rubiaceae). Internet 2 pp. http://www.plantzafrica.com/plantqrs/rothmanglob.htm.

BEATTIE, A.J., BARTHLOTT, W., ELIZABETSKY, E., FARREL, R., KHENG, C.T., PRANCE, I., ROSENTHAL, J., SIMPSON, D., LEAKEY, R., WOLFSON, M. & TEN KATE, K. 2005. New products and industries from biodiversity. In R. Hassan, R. Scholes & N. Ash, *Ecosystems and human wellbeing: current state and trends: findings of the Condition and Trends Working Group*, vol. 1: 271–295. Millenium Ecosystem Assessment. Island Press, Washington, Covelo, London.

BEHR, K. 2005-06. *Ochna pulchra* Hook.f. (Ochnaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/ochnapul.htm.

BEHR, K. 2005-08. *Dombeya pulchra* N.E.Br. (Sterculiaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/dombeypul.htm.

BESTER, S.P. 2005-10. *Ancylobotrys capensis* (Oliv.) Pichon (Apocynaceae). Internet 5 pp. http://www.plantzafrica.com/plantab/ancylobcap.htm.

BESTER, S.P. 2006. *Orbea* Haw. (Apocynaceae). Internet 8 pp. http://www.plantzafrica.com/plantnop/orbea.htm.

BESTER, S.P., ARCHER, R.H. & CONDY, G. (Artist). 2005. *Hoodia flava* (Apocynaceae: Asclepiadoideae). *Flowering Plants of Africa* 59: 100–106, t. 2215.

BESTER, S.P. & RETIEF, E. 2005. *Ehretia namibiensis* subsp. *namibiensis*: a new distribution record in the *Flora of southern Africa* (*FSA*) region. *Bothalia* 35: 163.

BESTER, S.P. & VICTOR, J.E. 2005. *Schizoglossum umbelluliferum*: an unusual milkweed re-collected in Pretoria after 109 years. *Veld & Flora* 91: 166.

BOMHARD, B., RICHARDSON, D.M., DONALDSON, J.S., HUGHES, G.O., MIDGLEY, G.F., RAIMONDO, D.C., REBELO, A.G., ROUGET, M. & THUILLER, W. 2005. Potential impacts of future land use and climate change on the Red List status of the Proteaceae in the Cape Floristic Region, South Africa. *Global Change Biology* 11: 1452–1468.

BREDENKAMP, C.L. 2005-11. *Nylandtia scoparia* (Eckl. & Zeyh.) Goldblatt & J.C.Manning (Polygalaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/nyladscop.htm.

BREDENKAMP, C.L. & SMITH, G.F. 2006. Abstract: Flora of the Eastern Cape. *Proceedings of the Annual Congress of the South African Association of Botanists, Nelson Mandela Metropolitan University, Port Elizabeth* 32: 87.

BROENNIMANN, O., THUILLER, W., HUGHES, G.O., MIDGLEY, G.F., ALKEMADE, J.M.R. & GUISAN, A. 2006. Do geographic distribution, niche property and life form explain plants' vulnerability to global change? *Global Change Biology* 12: 1079–1093.

BURGOYNE, P.M. 2005-10. *Delosperma* N.E.Br. (Mesembryanthemaceae). Internet 6 pp. http://www.plantzafrica.com/plantcd/delosperma.htm.

BURGOYNE, P.M. 2006. Searching for *Delosperma* in Eastern Cape. *Plantlife* 32: 29–33.

BURGOYNE, P.M., VAN WYK, A.E., ANDERSON, J.M. & SCHRIRE, B.D. 2005. Phanerozoic evolution of plants on the African plate. *Journal of African Earth Sciences* 43: 13–52.

BURRING, J.H. 2005-08. *Scolopia mundii* (Eckl. & Zeyh.) Warb. (Flacourtiaceae). Internet 4 pp. http://www.plantzafrica.com/plantqrs/scolopmund.htm.

BURRING, J.H. & VAN DER WALT, L. 2006. The weed exchange. A new garden at Kirstenbosch puts the spotlight on problem plants South Africa has given the World. *Veld & Flora* 92: 18–22.

BURROWS, J.E. & WILLIS, C.K. (eds). 2005. *Plants of the Nyika Plateau: an account of the vegetation of the Nyika National Parks of Malawi and Zambia*. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria.

CAROLUS, B. 2005-09. *Erica leucotrachela* H.A.Baker (Ericaceae). Internet 2 pp. http://www.plantzafrica.com/plantefg/ericaleucotrach.htm.

CAROLUS, B. 2005-12. *Erica fastigiata* L. (Ericaceae) Internet 2 pp. http://www.plantzafrica.com/plantefg/ericafast.htm.

CHESSELET, P. 2005-05. *Sceletium tortuosum* (L.) N.E.Br. (Mesembryanthemaceae). Internet 3 pp. http://www.plantzafrica.com/plantqrs/sclettort.htm.

CHESSELET, P. & PIGNAL, M. 2005. Lamarck's new species of Mesembryanthemaceae and the types of their names. *Bothalia* 35: 29–33.

CRAVEN, P. & STEENKAMP, Y. 2005. Centres of plant endemism and diversity in SABONET countries. *SABONET News* 9: 16.

CROUCH, N.R., LANGLOIS, A., MULHOLLAND, D.A. & NAIR, J.J. 2005. A novel alkylamide from the leaves of *Acmella caulirhiza* (Asteraceae), a traditional surface analgesic. *South African Journal of Botany* 71: 228–230.

CROUCH, N.R., LÖTTER, M.C., KRYNAUW, S. & POTTAS-BIRCHER, C. 2005. *Siphonochilus aethiopicus*. In G. Nichols, *Growing rare plants: a practical handbook on propagating the threatened plants of southern Africa*: 149–152. Southern African Botanical Diversity Network Report No. 36. SABONET, Pretoria.

CROUCH, N.R., SMITH, G.F. & CONDY, G. (Artist). 2005. *Impatiens flanaganiae*. (Balsaminaceae). *Flowering Plants of Africa* 59: 84–92, t. 2213.

CROUCH, N.R. & SYMMONDS, R. 2006. Propagation technologies for medicinal plants. In N. Diederichs, *Commercializing medicinal plants: a southern African guide*: 55–66. Sun Press, Stellenbosch.

CROUCH, N.R., SYMMONDS, R., SPRING, W. & DIEDERICHS, N. 2005. Fact sheet for growing popular medicinal plant species. In N. Diederichs, *Commercializing medicinal plants: a southern African guide*: 99–144. Sun Press, Stellenbosch.

CUPIDO, C. 2005-08. *Aspalathus* L. (Fabaceae). Internet 5 pp. http://www.plantzafrica.com/plantab/aspalathus.htm.

CUPIDO, C. 2005-12. *Merciera* A.DC. (Campanulaceae). Internet 3 pp. http://www.plantzafrica.com/plantklm/merciera.htm.

DAVIDOFF, S., STRUTHERS, K. & VAN JAARSVELD, E.J. 2005. The Towerland succulent roof garden. *Veld & Flora* 91: 142–144.

DAVIS, K., WILLIAMS, C. & WOLFSON, M. 2006. DNA banking and the Convention on Biological Diversity. In V. Savolainen, M.P. Powell, K. Davis, G. Reeves & A. Corthals, *DNA and tissue banking for biodiversity and conservation: theory, practice and uses*: 18–29. Kew Publishing in association with IUCN.

DAVIS, K., WILLIAMS, C., WOLFSON, M. & DONALDSON, J. 2006. Practical implementation of the CBD and CITES. In V. Savolainen, M.P. Powell, K. Davis, G. Reeves & A. Corthals, *DNA and tissue banking for biodiversity and conservation: theory, practice and uses*: 36–46. Kew Publishing in association with IUCN.

DEMISSEW, S., NIC LUGHADHA, E. & SMITH, G.F. 2005. Abstract: The African Plants Initiative: digitising and datasharing through Aluka. *Abstracts of the International Botanical Congress, Vienna, Austria* 17: 209.

DIFOLOKO, J.A. 2005-06. *Faidherbia albida* (Delile) A.Chev. (Fabaceae). Internet 3 pp. http://www.plantzafrica.com/plantefg/faidalb.htm.

DLAMINI, M.D. 2005-06. *Acacia polyacantha* Willd. subsp. *campylacantha* (Hochst. ex A.Rich.) Brenan (Fabaceae: Mimosoideae). Internet 4 pp. http://www.plantzafrica.com/plantab/acaciapoly.htm.

DLAMINI, M.D. 2005-10. *Mystroxylon aethiopicum* (Thunb.) Loes. (Celastraceae). Internet 3 pp. http://www.plantzafrica.com/plantklm/mystroxaeth.htm.

DLAMINI, M.D. 2005-12. *Acacia erioloba* E.Mey. (Fabaceae). Internet 4 pp. http://www.plantzafrica.com/plantab/acaciaeriol.htm.

DLAMINI, M.D. 2005-12. *Croton gratissimus* Burch. (Euphorbiaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/crotongrat.htm.

DONALDSON, J.S. 2006a. Review: Ex situ plant conservation: supporting species survival in the wild, by E.O. Guerrant Jr, K. Havens & M. Maunder, 2004. *South African Journal of Botany* 72: 306.

DONALDSON, J.S . 2006b. Preventing plant extinctions due to unsustainable international trade. In C.K. Willis, Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 47–49. South African National Biodiversity Institute, Pretoria.

DUNCAN, G. 2005. *Haemanthus* and their cultivation. *The Plantsman* 4: 220–226.

DUNCAN, G. 2005-06. *Onixotis stricta* (Burm.f.) Wijnands (Colchicaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/onixotis.htm.

DUNCAN, G. 2005-07. *Babiana pygmaea* (Burm.f.) Baker (Iridaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/babianpyg.htm.

DUNCAN, G. 2005-09. *Moraea gigandra* L.Bolus (Iridaceae). Internet 4 pp. http://www.plantzafrica.com/plantklm/moragigan.htm.

DUNCAN, G. 2005-10. *Dierama pendulum* (L.f.) Baker (Iridaceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/dieramapend.htm.

DUNCAN, G., McMASTER, C. & McMASTER, R. 2005. Out of the ashes (*Lachenalia sargeantii*). *Veld & Flora* 91: 66–69.

DU TOIT, K., ELGORASHI, E.E., MALAN, S.F., DREWES, S.E., VAN STADEN, J., CROUCH, N.R. & MULHOLLAND, D.A. 2005. Anti-inflammatory activity and QSAR studies of compounds isolated from Hyacinthaceae species and *Tachiadenus longiflorus* Griseb. (Gentianaceae). *Bioorganic & Medicinal Chemistry* 13 : 2561–2568.

EBRAHIM, I., VON WITT, C.G. & COHEN, C. 2005. Peacocks, ploughs and porcupines: the plight of the peacock moraeas. *Veld & Flora* 91: 185–187.

FERREIRA, L. 2005-11. *Panicum maximum* Jacq. (Poaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/panicummax.htm.

FISH, L. 2005a. Cyperaceae, Commelinaceae, Poaceae. In J.E. Burrows & C.K. Willis, *Plants of the Nyika Plateau: an account of the vegetation of the Nyika National Parks of Malawi and Zambia*: 294–305, 338–366. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria.

FISH, L. 2005b. *Eragrostis superba* Peyr. (Poaceae). Internet 2 pp. http//www.plantzafrica.com/plantefg/eragrostsup.htm.

FISH, L. 2005-07. *Pogonarthria squarrosa* (Roem. & Schult.) Pilg. (Poaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/pogonsqua.htm.

FODEN, W., MIDGLEY, G.F., HUGHES, G.O., THUILLER, W., BISHOP, J., BOND, W.J., HOFFMAN, M.T., KALEME, P., REBELO, P. & HANNAH, L. 2005. The impacts of climate change on *Aloe dichotoma* (the *kokerboom*): implications for the conservation and management of threatened plants. *South African Journal of Botany* 71: 265.

FODEN, W. & SMITH, G.F. 2006. Objective 1: understanding and documenting plant diversity. Plants under threat: Red Data Lists to the rescue. Target 2: a preliminary assessment of the conservation status of all known plant species, at national, regional and international levels. In C.K. Willis, Conserving South Africa's plants. A South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 15–18. South African National Biodiversity Institute, Pretoria.

FOREST, F. & SAVOLAINEN, V. 2005. Species-level phylogenies from continental biodiversity hotspots. In F.T. Bakker, L.W. Chatrou, B. Gravendeel & P.B. Pelser, *Plant species-level systematics: new perspectives on pattern and process*: 17–30. Gantner Verlag, Ruggell, Liechtenstein.

FORRESTER, J. 2005-04. *Pelargonium grossularioides* (L.) L'Hér. (Geraniaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/pelarggross.htm.

FORRESTER, J. 2005-08. *Pterocelastrus tricuspidatus* (Lam.) Sond. (Celastraceae). Internet 4 pp. http://www.plantzafrica.com/plantnop/pterocelastri.htm.

FRAZEE, S., BARNARD, P. & COWLING, R.M. 2005. |Ai-|Ais-Richtersveld-Sperrgebiet: transboundary conservation in an arid hotspot. In R.A. Mittermeier, C.F. Kormos, C.G. Mittermeier, G.P. Robles, T. Sandwith & C. Besançon, *Transboundary conservation: a new vision for protected areas*: 257–263. CEMEX/ Conservation International.

FULLARD, D. 2005. Biodiversity education at Kirstenbosch Botanical Garden. World Heritage Convention. *Roots* 2,1: 26–28.

GERMISHUIZEN, G., CROUCH, N.R. & CONDY, G. (Artist). 2005. *Afzelia quanzensis*. (Fabaceae: Caesalpinioideae). *Flowering Plants of Africa* 59: 74–83, t. 2212.

GLEN, H.F. 2005-06. *Dierama reynoldsii* I.Verd. (Iridaceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/dieramrey.htm.

GLEN, H.F. 2005-10. *Bruguiera gymnorrhia* (L.) Lam. (Rhizophoraceae). Internet 5 pp. http://www.plantzafrica.com/plantab/bruggym.htm.

GLEN, H.F. 2005a. What's in a name? Where do these names come from? *The Gardener*, Aug.: 39.

GLEN, H.F. 2005b. What's in a name? Ferrari and his Tale of Limax and Bruchus! *The Gardener*, Sept.: 54, 55.

GLEN, H.F. 2005c. What's in a name? Grünes, Paradieser, Kukuruz, Grürken. *The Gardener*, Oct.: 41.

GLEN, H.F. 2005d. What's in a name? More hot stuff! *The Gardener*, Nov.: 48.

GLEN, H.F. 2005e. What's in a name? More hot stuff! *The Gardener*, Dec.: 58.

GLEN, R. 2005. Review: Floating islands: a global bibliography, by C. van Duzer, 2004. *African Journal of Aquatic Science* 30: 219, 220.

GLEN, R. 2005-12. *Gunnera perpensa* L. (Gunneraceae). Internet 4 pp. http://www.plantzafrica.com/plantefg/gunnerperp.htm.

GOLDBLATT, P., BERNHARDT, P. & MANNING, J.C. 2005. Pollination mechanisms in the African genus *Moraea* (Iridaceae, Iridoideae): floral divergence and adaptation for pollinators. *Adansonia*, sér. 3, 27: 21–46.

GOLDBLATT, P., DOLD, A.P. & MANNING, J.C. 2005. Three cryptic new species of *Aristea* (Iridaceae) from southern Africa. *Bothalia* 35: 1–6.

GOLDBLATT, P. & MANNING, J.C. 2005. Taxonomic notes on *Babiana* and *Ferraria* in arid western southern Africa (Iridaceae). *Bothalia* 35: 71–74.

GOLDBLATT, P., MANNING, J.C. & BERNHARDT, P. 2005. The floral biology of *Melasphaerula* (Iridaceae: Crocoideae): is this monotypic genus pollinated by March flies (Diptera: Bibionidae)? *Annals of the Missouri Botanical Garden* 92: 268–274.

GOLDBLATT, P., MANNING, J.C. & SNIJMAN, D. 2005. Cape plants: corrections and additions to the flora. 1. *Bothalia* 35: 35–46.

GRYZENHOUT, M., GLEN, H.F., WINGFIELD, B.D. & WINGFIELD, M.J. 2005. (1686) Proposal to conserve the name *Cryphonectria* (Diaporthales) with a conserved type. *Taxon* 54: 539, 540.

GUISAN, A. & THUILLER, W. 2005. Predicting species distribution: offering more than simple habitat models. *Ecology Letters* 8: 993–1009.

HANKEY, A. 2005-06. *Mimusops zeyher* Sond. (Sapotaceae). Internet 3 pp. http://www.plantzafrica.com/plantklm/mimusopzey.htm.

HANKEY, A. 2005-09. *Cussonia transvaalensis* Reyneke (Araliaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/cussontrans.htm.

HANKEY, A. 2005a. Letter from Johannesburg. *South African Gardening*, Sept.: 105.

HANKEY, A. 2005b. Africa tamed. *South African Gardening*, Dec.: 30–33.

HANKEY, A. 2005c. Choosing the right tree for the job. *My World* 3: 59.

HANKEY, A. 2005d. Nature's wonder drink, rooibos. *My World* 6: 47, 48.

HANNAH, L., MIDGLEY, G., HUGHES, G. & BOMHARD, B. 2005. The view from the Cape: extinction risk, protected areas, and climate change. *BioScience* 55: 231–242.

HARROWER, A. Review: Cotyledon and Tylecodon, by E. van Jaarsveld & D. Koutnik. *Veld & Flora* 91: 93.

HERMAN, P.P.J. 2005a. Infraspecific taxa in a southern African *Pavetta* species (Rubiaceae). *Bothalia* 35: 84–87.

HERMAN, P.P.J. 2005b. Review: Riches of the forest: for health, life and spirit in Africa, edited by Citlalli López & Patricia Shanley, 2004. *Bothalia* 35: 185, 186.

HERMAN, P.P.J. 2005-07. *Dimorphothea jucunda* E.Phillips (Asteraceae/Compositae). Internet 4 pp. http://www.plantzafrica.com/plantcd/dimorphjuc.htm.

HERMAN, P.P.J. 2005-09. *Hymenolepis parviflora* (L.) DC. (Asteraceae/Compositae). Internet 3 pp. http://www.plantzafrica.com/planthij/hymenolepparv.htm.

HITCHCOCK, A. 2006. Restoration conservation at Kirstenbosch. *Veld & Flora* 92: 40–44.

HUNTLEY, B.J., WILLIS, C.K. & PRIVETT, S.D.J. 2006. Training in plant conservation. In C.K. Willis, Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 63–65. South African National Biodiversity Institute, Pretoria.

HURTER, P.J.H. & VAN WYK, A.E. 2005. *Acacia ormocarpoides* (Mimosoideae) from Sekhukhuneland (Fabaceae). *Bothalia* 35: 166–169.

JODAMUS, N. 2005-04. *Diosma prama* I.Williams (Rutaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/diosprama.htm.

JODAMUS, N. 2005-05. *Acmadenia obtusata* (Thunb.) Bartl. & H.L.Wendl. (Rutaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/acmadenobst.htm.

JODAMUS, N. 2005-05. *Adenandra obtusata* Sond. (Rutaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/adenandobt.htm.

JODAMUS, N. 2005-11. *Diosma hirsuta* L. 'Blue Downs'. (Rutaceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/diosmahirsutbd.htm.

JOHNSON, I.M. 2005-10. *Anemone fanninii* Harv. ex Mast. (Ranunculaceae). Internet 2 pp. http://www.plantzafrica.com/plantab/anemonfan.htm.

JOHNSON, I.M., EDWARDS, T.J. & CONDY, G. (Artist). 2005. *Gerbera aurantiaca* (Asteraceae). *Flowering Plants of Africa*. 59: 134–139, t. 2220.

JOHNSON, I.M. & TARR, B. 2005. *Gerbera aurantiaca*. The Hilton daisy. In G. Nichols, *Growing rare plants: a practical handbook on propagating the threatened plants of southern Africa*: 78, 79. Southern African Botanical Diversity Network Report No. 36. SABONET, Pretoria.

JORDAAN, M. 2005a. Die ghwarries van Suid-Afrika. *Dendron* 37: 23–27.

JORDAAN, M. 2005b. *FSA* contributions 18: Salicaceae *s. str.* *Bothalia* 35: 7–20.

JORDAAN, M. 2005-11. *Ficus ingens* (Miq.) Miq. (Moraceae). Internet 4 pp. http://www.plantzafrica.com/plantefg/ficusingens.htm.

JORDAAN, M. & VAN WYK, A.E. 2005. A new species of *Gymnosporia* (Celastraceae) from southern Africa. *Novon* 15: 301–304.

KGOPE, B.S., MIDGLEY, G.F., BOND, W.J. & WOODWARD, F.I. 2005. Evidence for a CO_2 controlled mechanism to explain tree invasion of African savannas and adjacent grasslands. *South African Journal of Botany* 71: 267.

KHANYILE, S. 2006-01. *Gnidia triplinervis* Meisn. (Thymelaeaceae). Internet 2 pp. http://www.plantzafrica.com/plantefg/gnidiatrip.htm.

KHANYILE, S. 2006-01. *Watsonia canaliculata* Goldblatt (Iridaceae). Internet 2 pp. http://www.plantzafrica.com/plantwxyz/watsoncanal.htm.

KLOPPER, R.R. 2005a. Collecting good herbarium specimens (Part 2). *Pteridoforum* 73: 1–3.

KLOPPER, R.R. 2005b. Now you know! William Townsend Aiton (1766–1849). *Pteridoforum* 73: 6.

KLOPPER, R.R. 2005c. Ferns in outer space. *Pteridoforum* 75: 3–5.

KLOPPER, R.R. 2005-09. *Ornithogalum saundersiae* Baker (Hyacinthaceae). Internet 4 pp. http://www.plantzafrica.com/plantnop/ornithogsaund.htm.

KLOPPER, R.R. 2005-11. *Galtonia candicans* (Baker) Decne. (Hyacinthaceae). Internet 2 pp. http://www.plantzafrica.com/plantefg/galtoncand.htm.

KLOPPER, R.R. 2006. *Thelypteris* or not *Thelypteris*? *Pteridoforum* 76: 1–4.

KLOPPER, R.R., SMITH, G.F., GAUTIER, L., CHATELAIN, C. & SPICHIGER, R. 2006. Abstract: The African Plant Checklist and Database Project. *Proceedings of the Annual Congress of the South African Association of Botanists*, Nelson Mandela Metropolitan University, Port Elizabeth 32: 93.

KNIGHT, A., DRIVER, A., COWLING, R.M., MAZE, K., DESMET, P., LOMBARD, A.T., ROUGET, M., BOTHA, M., BOSHOFF, A.F., CASTLEY, G.J., GOODMAN, P., MACKINNON, K., PIERCE, S.M., SIMS-CASTLEY, R., STEWART, W. & VON HASE, A. 2005. Improving our practice through social learning: perspectives and lessons from conservation planning in South Africa. *Conservation Biology* 20: 739–750.

KOEKEMOER, M. 2005. Bryophyta, Asteraceae. In J.E. Burrows & C.K. Willis, *Plants of the Nyika Plateau: an account of the vegetation of the Nyika National Parks of Malawi and Zambia*: 21–24, 78–113. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria.

KOEKEMOER, M. 2005-04. *Euryops tenuissimus* (L.) DC. (Asteraceae). Internet 3 pp. http://www.plantzafrica.com/plantefg/euryoptenu.htm.

KOORBANALLY, C., MULHOLLAND, D.A. & CROUCH, N.R. 2005a. A novel 3-hydroxy-3-benzyl-4chromanone-type homoisoflavonoid from *Albuca fastigiata* (Ornithogaloideae: Hyacinthaceae). *Biochemical Systematics and Ecology* 33: 545–549.

KOORBANALLY, C., MULHOLLAND, D.A. & CROUCH, N.R. 2005b. A novel homoisoflavonoid from *Drimia delagoensis* (Urgineoideae: Hyacinthaceae). *Biochemical Systematics and Ecology* 33: 743–748.

KURZWEIL, H. 2005a. Observations on the development of the placentas and closing bodies in the fruit capsules of some Mesembryanthema (Aizoaceae). *Botanische Jahrbücher* 126: 385–401.

KURZWEIL, H. 2005b. Taxonomic studies in the genus *Disperis* (Orchidaceae) in southeast Asia. *Blumea* 50: 143–152.

KURZWEIL, H. 2005-08. *Satyrium coriifolium* Sw. (Orchidaceae). Internet 3 pp. http://www.plantzafrica.com/plantqrs/satyrcori.htm.

KURZWEIL, H. 2005-12. *Bonatea speciosa* (L.f.) Willd. (Orchidaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/bonatspec.htm.

KURZWEIL, H. & BURROWS, S. (Artist). 2005. *Platycoryne mediocris* (Orchidaceae). *Flowering Plants of Africa* 59: 60–66, t. 2210.

KURZWEIL, H. & MANNING, J.C. 2005. A synopsis of the genus *Disperis* Sw. (Orchidaceae). *Adansonia*, sér. 3, 27: 155–207.

LANGLOIS, A., MULHOLLAND, D.A., DUNCAN, G.D., CROUCH, N.R. & EDWARDS, T.J. 2005. A novel 3-benzylchromone from the South African *Lachenalia rubida* (Hyacinthaceae). *Biochemical Systematics and Ecology* 33: 961–966.

LEISTNER, O.A., WINTER, P.J.D. & CONDY, G. (Artist). 2005. *Hibiscus coddii* subsp. *barnardii* (Malvaceae). *Flowering Plants of Africa* 59: 94–99, t. 2214.

LE ROUX, L. 2005-05. *Bauhinia tomentosa* L. (Fabaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/bauhintoment.htm.

LEZAR, A., DEARLOVE, K. & WOLFSON, M.M. 2006. Target 9: conserving crop diversity. In C. Willis, Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 40, 41.

LINDER, H.P., KURZWEIL, H. & JOHNSON, S.D. 2005. The southern African orchid flora: composition, sources and endemism. *Journal of Biogeography* 32: 29–47.

LITHUDZHA, E. 2005-08. *Boophone disticha* (L.f.) Herb. (Amaryllidaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/boophdist.htm.

LOVETT, J.C., BARNARD, P. & MIDGLEY, G.F. 2006. Policy piece: National Climate Change Conference in South Africa. *African Journal of Ecology* 43: 279–281.

LOVETT, J.C., MIDGLEY, G.F. & BARNARD, P. 2006. Policy piece: Climate change and ecology in Africa. *African Journal of Ecology* 43: 167–169.

LOW, B., POND, U. & VAN JAARSVELD, E.J. 2006. *Aloe kouebokkeveldensis*. A new species of *Aloe* endemic to the Cape fynbos. *Veld & Flora* 92: 30–33.

LUCKOW, M., HUGHES, C., SCHRIRE, B., WINTER, P., FAGG, C., FORTUNATO, R., HURTER, J., RICO, L., BRETELER, F.J., BRUNEAU, A., CACCAVARI, M., CRAVEN, L., CRISP, M., DELGADOS, A., DEMISSEW, S., DOYLE, J.J., GRETHER, R., HARRIS, S., HERENDEEN, P.S., HERNÁNDEZ, H.M., HIRSCH, A.M., JOBSON, R., KLITGAARD, B.B., LABAT, J.-N., LOCK, J.M., MACKINDER, B., PFEIL, B., SIMPSON, B.B., SMITH, G.F., SOUSA S., M., TIMBERLAKE, J., VAN DER MAESEN, J.G., VAN WYK, A.E., VORSTER, P., WILLIS, C.K., WIERINGA, J.J. & WOJCIECHOWSKI, M.F. 2005. *Acacia*: the case against moving the type to Australia. *Taxon* 54: 513–519.

MAKGAKGA, C. 2005-09. *Tapinanthus oleifolius* (J.C.Wendl.) Danser (Loranthaceae). Internet 2 pp. http://www.plantzafrica.com/planttuv/tapinanoleif.htm.

MALAN, C. & NOTTEN, A. 2005-04. *Trema orientalis* (L.) Blume (Celtidaceae). Internet 3 pp. http://www.plantzafrica.com.planttuv/tremorient.htm.

MALAN, C. & NOTTEN, A. 2005-05. *Crassula ovata* (Miller) Druce (Crassulaceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/crassovat.htm.

MALAN, C. & NOTTEN, A. 2006-01. *Carpobrotus edulis* (L.) L.Bolus (Mesembryanthemaceae). Internet 5 pp. http://www.plantzafrica.com/plantcd/carpobed.htm.

MANNING, J.C. 2005a. Pollination in *Clivia*. *Clivia* 7: 17–22.

MANNING, J.C. 2005b. The significance of colour and ultraviolet patterning in *Clivia miniata*. *Clivia* 7: 23–25.

MANNING, J.C. 2006. Plant profile: not grandma's horticulture. *Horticulture* Jan./Feb. 2006: 50–55.

MANNING, J.C., FOREST, F. & MANNHEIMER, C.A. 2005. *Eremiolirion*, a new genus of southern African Tecophilaeaceae, and taxonomic notes on *Cyanella alba*. *Bothalia* 35: 115–120.

MANNING, J.C. & GOLDBLATT, P. 2005a. A new species of *Freesia* (Iridaceae: Crocoideae) from the Succulent Karoo, South Africa, and notes on nomenclature and infrageneric classification. *Novon* 15: 168–172.

MANNING, J.C. & GOLDBLATT, P. 2005b. Radiation of pollination systems in the Cape genus *Tritoniopsis* (Iridaceae: Crocoideae) and the development of biomodal pollination strategies. *International Journal of Plant Sciences* 166: 459–474.

MANNING, J.C. & GOLDBLATT, P. 2005c. Two new species of Asteraceae from Northern and Western Cape, South Africa and a new synonym. *Bothalia* 35: 55–61.

MANNING, J.C. & GOLDBLATT, P. 2005d. A new species of *Harveya* from Western Cape, South Africa (Orobanchaceae). *Bothalia* 35: 89–91.

MBAMBEZELI, G. 2005-05. *Athrixia phylicoides* DC. (Asteraceae). Internet 2 pp. http://www.plantzafrica.com/plantab/athrixphyl.htm.

MBAMBEZELI, G. 2005-08. *Albuca batteniana* Hilliard & B.L.Burtt (Hyacinthaceae). Internet 2 pp. http://www.plantzafrica.com/plantab/albucabat.htm.

MBAMBEZELI, G. 2005-12. *Cryptocarya woodii* Engl. (Lauraceae). Internet 2 pp. http://www.plantzafrica.com/plantcd/crytocarwood.htm.

McCLEAN, C.J., LOVETT, J.C., KÜPER, W., HANNAH, L., SOMMER, J.H., BARTHLOTT, W., TERMANSEN, M., SMITH, G.F., TOKUMINE, S. & TAPLIN, J.R.D. 2005. African plant diversity and climate change. *Annals of the Missouri Botanical Garden* 92: 139–152.

MIDGLEY, G.F. 2005. Review: Climate change and the Kyoto protocol's Clean Development Mechanism, by M. Orford, S. Raubenheimer & B. Kantor, 2004. *Veld & Flora* 91: 149.

MIDGLEY, G.F. 2006a. Review: Adaptations and responses of woody plants to environmental stress, edited by Rajeev Arora. Food Products Press, New York, 2004. *South African Journal of Botany* 72: 185, 186.

MIDGLEY, G.F. 2006b. The Kyoto Protocol. In D. Parry-Davies, *Enviropaedia*: Environmental Encyclopaedia and Networking Directory for southern Africa. Eco-Logic Publishing, Cape Town.

MIDGLEY, G.F., CHAPMAN, R.A., HEWITSON, B., JOHNSTON, P., DE WIT, M., ZIERVOGEL, G., MUKHEIBIR, P., VAN NIEKERK, L., TADROSS, M., VAN WILGEN, B.W., KGOPE, B., MORANT, P.D., THERON, A., SCHOLES, R.J. & FORSYTH, G.G. 2005. *A status quo, vulnerability and adaptation assessment of the physical and socio-economic effects of climate change in the Western Cape*. CSIR Report No. ENV-S-C 2005-073.

MIDGLEY, G.F., REEVES, G., KLAK, C. & RICHARDSON, J. 2005. Late Tertiary and Quaternary climate change and centres of endemism in the southern African flora. In A. Purvis, J. Gittleman & T. Brooks, *Phylogeny and conservation*: 230–242. Cambridge University Press, Cambridge.

MIDGLEY, G.F., SCHOLES, R.J., HEWITSON, B. & SCHULZE, R.E. 2005. Climate change: no trivial threat. *Farmers Weekly* 95035: 10, 11.

MIDGLEY, G.F. & THUILLER, W. 2005. Global environmental change and the uncertain fate of biodiversity. *New Phytologist* 167: 638–641.

MILLS, A.J. 2006. The role of salinity and sodicity in the dieback of *Acacia xanthophloea* in Ngorongoro Caldera, Tanzania. *African Journal of Ecology* 44: 61–71.

MILLS, A.J. & COWLING, R.M. 2006. Rate of carbon sequestration at two thicket restoration sites in the Eastern Cape, South Africa. *Restoration Ecology* 14: 38–49.

MILLS, A.J., COWLING, R.M., FEY, M.V., KERLEY, G.I.H., DONALDSON, J.S., LECHMERE-OERTEL, R.G., SIGWELA, A.M., SKOWNO, A.L. & RUNDEL, P. 2005. Effects of goat pastoralism on ecosystem carbon storage in semi-arid thicket, Eastern Cape, South Africa. *Austral Ecology* 30: 797–804.

MILLS, A.J. & FEY, M.V. 2005. Interactive response of herbivores, soils and vegetation to annual burning in a South African savanna. *Austral Ecology* 30: 435–444.

MILLS, A.J., O'CONNOR, T.G., DONALDSON, J.S., FEY, M.V., SKOWNO, A.L., SIGWELA, A.M., LECHMERE-OERTEL, R.G. & BOSENBERG, J.D. 2005. Ecosystem carbon storage under different land uses in three semi-arid shrublands and a mesic grassland in South Africa. *South African Journal of Plant and Soil* 22: 183–190.

MNENGWANE, J. 2005-10. *Helichrysum appendiculatum* (L.f.) Less. (Asteraceae). Internet 3 pp. http://www.plantzafrica.com/planthij/helichrysappend.htm.

MOODLEY, K. 2005-10. *Syncolostemon rotundifolius* E.Mey. ex Benth. (Lamiaceae). Internet 3 pp. http://www.plantzafrica.com/plantqrs/syncolosrotund.htm.

MPONGO, T. 2005-04. *Merxmuellera macowanii* (Stapf) Conert (Poaceae). Internet 2 pp. http://www.plantzafrica.com/plantklm/merxmac.htm.

MTSWENI, P. 2005-10. *Podocarpus latifolius* (Thunb.) R.Br. ex Mirb. (Podocarpaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/podocarplati.htm.

MUCINA, L. & RUTHERFORD, M.C. (eds). 2005 (2004-02). *Vegetation map of South Africa, Lesotho and Swaziland: shapefiles of basic mapping units. Beta version 4.0.* South African National Biodiversity Institute, Cape Town.

MUCINA, L., RUTHERFORD, M.C. & POWRIE, L.W. (eds). 2005. *Vegetation map of South Africa, Lesotho and Swaziland*; 1:1 000 000 scale sheet maps. South African National Biodiversity Institute, Pretoria.

MUKOMA, T. 2005-05. *Pelargonium tranvaalense* Knuth (Geraniaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/pelargtransvaal.htm.

MUKOMA, T. 2005-07. *Becium obovatum* (E.Mey. ex Benth.) N.E.Br. subsp. *obovatum* var. *obovatum* (Lamiaceae). Internet 2 pp. http://www.plantzafrica.com/plantab/beciumob.htm.

MUKOMA, T. 2005-07. *Hoslundia opposita* Vahl. (Lamiaceae). Internet 2 pp. http://www.plantzafrica.com/planthij/hoslundop.htm.

MUSIL, C.F., MILTON, S.J. & DAVIS, G.W. 2005. The threat of alien invasive grasses to lowland Cape floral diversity: an empirical appraisal of the effectiveness of practical control strategies. *South African Journal of Science* 101: 337–344.

NAIDOO, A. 2005-11. *Gomphocarpus fruticosus* (L.) Aiton f. (Asclepiadaceae). Internet 2 pp. http://www.plantzafrica.com/plantefg/gomphocarpfrut.htm.

NAIDOO, D., COOMBES, P.H., MULHOLLAND, D.A., CROUCH, N.R. & VAN DEN BERGH, A.J.J. 2005. N-substituted acridone alkaloids from *Toddaliopsis bremekampii* (Rutaceae: Toddalioideae) of south-central Africa. *Photochemistry* 66: 1724–1728

NDOU, A.P. 2005-05. *Berchemia zeyheri* (Sond.) Grubov (Rhamnaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/berchemzy.htm.

NEILSON, R.P., PITELKA, L.F., SOLOMON, A., NATHAN, R., MIDGLEY, G.F., FRAGOSO, J., LISCHE, H. & THOMPSON, K. 2005. Forecasting regional to global plant migration in response to climate change: challenges and directions. *BioScience* 55: 749–759.

NELSON, E.C. & OLIVER, E.G.H.. 2005. Chromosome numbers in *Erica*—an updated checklist. *Heathers* 2: 57, 58.

NGWENYA, M.A. 2005-06. *Acridocarpus natalitius* A.Juss. var. *natalitius* (Malpighiaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/acridnatal.htm.

NGWENYA, M.A. 2005-06. *Gardenia cornuta* Hemsl. (Rubiaceae). Internet 3 pp. http://www.plantzafrica.com/plantefg/gardencorn.htm.

NONKENGE, S. & NOTTEN, A. 2005-09. *Watsonia borbonica* (Pourr.) Goldblatt (Iridaceae). Internet 5 pp. http://www.plantzafrica.com/plantwxyz/watsonborb.htm.

NORDENSTAM, B. & VAN JAARSVELD, E. 2005. *Othonna cremnophila*, a new species of the Asteraceae-Senecioneae from the Richtersveld, Northern Cape Province, South Africa. *Aloe* 42: 4–7.

NOTTEN, A. 2005-05. *Calpurnia aurea* (Aiton) Benth. subsp. *aurea* (Fabaceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/calpurnaur.htm.

NOTTEN, A. 2005-05. *Morella cordifolia* (L.) Killick (Myricaceae). Internet 5 pp. http://www.plantzafrica.com/plantklm/morelcord.htm.

NOTTEN, A. 2005-06. *Cassine peragua* L. (Celastraceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/casspera.htm.

NOTTEN, A. 2005-12. *Vernonia natalensis* Sch.Bip. ex Walp. (Asteraceae). Internet 4 pp. http://www.plantzafrica.com/planttuv/vernonnat.htm.

NOTTEN, A. 2006-01. *Agapanthus campanulatus* F.M.Leight. (Agapanthaceae). Internet 4 pp. http://www.plantzafrica.com/plantab/agapancamp.htm.

NOTTEN, A. 2006-01. *Agapanthus praecox* Willd. subsp. *minimus* (Lindl.) F.M.Leight. 'Adelaide' (Agapanthaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/agapanadelaide.htm.

NOTTEN, A. 2006-02. *Dissotis princeps* (Kunth) Triana (Melastomataceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/dissotprin.htm & http://www.plantzafrica.com/plantcd/plimagescd/dissotprinstamens.jpg.

OLIVER, I.B. 2005. *Grow succulents*. Kirstenbosch Gardening Series, edn 2. South African National Biodiversity Institute, Cape Town.

OLIVER, I.B. 2005-04. *Dioscorea elephantipes* (L'Hér.) Engl. (Dioscoreaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/dioscoreleph.htm.

OLIVER, I.B. 2005-04. *Nymania capensis* (Thunb.) Lindb. (Meliaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/nymancap.htm.

OLIVER, I.B. 2005-05. *Crassula rupestris* Thunb. (Crassulaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/crassularupest.htm.

OLIVER, I.B. 2005-07. *Euphorbia stellispina* Haw. (Euphorbiaceae). Internet 3 pp. http://www.plantzafrica.com/plantefg/euphorbstel.htm.

OLIVER, I.B. 2005-07. *Hoodia gordonii* (Masson) Sweet ex Decne. (Apocynaceae). Internet 3 pp. http://www.plantzafrica.com/planthij/hoodgord.htm.

OLIVER, I.B. 2005-07. *Lithops* N.E.Br. (Aizoaceae). Internet 3 pp. http://www.plantzafrica.com/plantklm/lithops.htm.

OLIVER, I.B. 2005-08. *Crassula atropurpurea* (Haw.) D.Dietr. (Crassulaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/crassatrop.htm.

PIERCE, S.M., COWLING, R.M., KNIGHT, A., LOMBARD, A.T., ROUGET, M. & WOLF, T. 2005. Systematic conservation planning products for land-use planning: interpretation for implementation. *Biological Conservation* 125: 441–548.

PIERCE, S.M., COWLING, R.M., LOMBARD, M., ROUGET, M., WOLF, T., VLOK, J., KNIGHT, A., BOSHOFF, A. & WILSON, S. 2005. A STEP forward. Safeguarding the biodiversity of the south-eastern Cape region. *Veld & Flora* 91: 86–89.

PORCHES, S., COWLING, R.M., GOLDBLATT, P., MANNING, J.C. & SNIJMAN, D.A. 2006. An overview of the Cape geophytes. *Biological Journal of the Linnean Society* 87: 27–43.

PYKE, C.R., ANDELMAN, S.J. & MIDGLEY, G. 2005. Identifying priority areas for bioclimatic representation under climate change: a case study for Proteaceae in the Cape Floristic Region, South Africa. *Biological Conservation* 125: 1–9.

RAIMONDO, D. 2005. Conservation news: members of the CREW. *Veld & Flora* 91: 64, 65.

RAIMONDO, D., NEWTON, D., FELL, C., DONALDSON, J.S. & DICKSON, B. 2005. Devil's claw, *Harpagophytum* spp. in South Africa: conservation and livelihoods issues. *Traffic Bulletin* 20,3: 99–112.

RAMBUWANI, L.D., GAVHI, M.P. & REYNOLDS, Y. 2005-09. *Diospyros lycioides* Desf. (Ebenaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/diospyroslyc.htm.

REEVES, G., MANNING, J.C., GOLDBLATT, P., RAIMONDO, D. & WOLFSON, M. 2006. Genetic resources, systematics and the CBD: a case for DNA banking in South Africa. In V. Savolainen, M.P. Powell, K. Davis, G. Reeves & A. Corthals, *DNA and tissue banking for biodiversity and conservation: theory, practice and uses*: 72–81. Kew Publishing in association with IUCN.

RETIEF, E. 2005-05. *Cynoglossum hispidum* Thunb. (Boraginaceae). Internet 2 pp. http://www.plantzafrica.com/plantcd/cynogloshipsp.htm.

RETIEF, E. 2005-05. *Trichodesma physaloides* (Frenzl) A.DC. (Boraginaceae). Internet 3 pp. http://www.plantzafrica.com/planttuv/trichodesphy.htm.

RETIEF, E., VAN WYK, A.E. & CONDY, G. (Artist). 2005. *Codon royenii* (Boraginaceae). *Flowering Plants of Africa* 59: t. 2217, 114–121.

RICHARDSON, D.M., ROUGET, M., RALSTON, S. & COWLING, R.M. 2005. Determinants of alien plant species richness in South Africa: environmental correlates and the relationship with native plant species richness. *EcoScience* 12: 391–402.

ROFF, J., WILLIS, C.K. & FODEN, W. 2006. Making plants relevant to real life. In C.K. Willis, Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 57–62. South African National Biodiversity Institute, Pretoria.

ROUGET, M., COWLING, R.M., LOMBARD, A.T., KNIGHT, A. & KERLEY, G.I.H. 2006. Designing large-scale conservation corridors for pattern and process. *Conservation Biology* 20: 549–561.

ROURKE, J.P. 2005. A new *Leucadendron* (Proteeae) from Western Cape, South Africa. (Proteaceae). *Bothalia* 35: 63–67.

ROUX, J.P. 2005. Ferns. In G. Nichols, *Growing rare plants*. Southern African Botanical Diversity Network Report No. 36: 19–21.

ROUX, J.P. 2005-05. *Pyrrosia* Mirb. (Polypodiaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/pyrrosia.htm.

SAVOLAINEN, V., POWELL, M.P., DAVIS, K., REEVES, G. & CORTHALS, A. 2006. *DNA and tissue banking for biodiversity and conservation: theory, practice and uses*. Kew Publishing, in association with IUCN.

SCHURR, F.M., BOND, W.J., MIDGLEY, G.F. & HIGGINS, S.J. 2005. A mechanistic model for secondary seed dispersal by wind and its experimental validation. *Journal of Ecology* 93: 1017–1028.

SIEBERT, S.J. & SMITH, G.F. 2005. Plant Red Data List assessments in southern Africa: financial costs of a collaborative project. *Taxon* 54: 1051–1055.

SIMMONS, R. & BARNARD, P. 2005. Turning up the heat—looking at climate change impacts on African birds. *Africa Birds and Birding* 10,5: 52–60.

SINGH, Y. 2005-12. *Ornithogalum thyrsoides* Jacq. (Hyacinthaceae). Internet 4 pp. http://www.plantzafrica.com/plantnop/ornithogthyr.htm.

SMITH, G.F. 2005a. The rich floral heritage of South Africa. *Proceedings of the International Science and Technology Exposition*: 60–68. Department of Science and Technology, Aichi, Japan.

SMITH, G.F. 2005b. Aalwyne vir Afrika. *Tuinpaleis* June: 10–13, 15.

SMITH, G.F. 2005c. *Gardening with succulents. Horticultural gifts from extreme environments and the arid world.* Struik, Cape Town.

SMITH, G.F. 2005d. The fascinating world of the grass aloes of South Africa. In C. Craib, *Grass aloes of the South African veld.* Umdaus Press, Hatfield, Pretoria.

SMITH, G.F. 2005e. The Boyce Thompson Arboretum near Superior, Arizona: a stunning botanical and succulent garden in cowboy country. *Aloe* 42: 28–34.

SMITH, G.F. 2005f. SABONET—some ten years on. *SABONET News* 9: 4.

SMITH, G.F. 2005g. 2003 Compton Prize awarded to trio from the Western Cape. *SABONET News* 9: 69.

SMITH, G.F. & CRAIB, C. 2005. *Aloe craibii* and its environment. *Cactus and Succulent Journal (U.S.)* 77: 202–204.

SMITH, G.F. & SMITH, T.J. 2006. Objective 1: understanding and documenting plant diversity. Catalogues of South African plant life: documenting diversity for the benefit of all. Target 1: a widely accessible working list of known plant species, as a step towards a complete world flora. In C.K. Willis, Conserving South Africa's plants. A South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 12–14. South African National Biodiversity Institute, Pretoria.

SMITH, G.F. & STEYN, E.M.A. 2005a. Notes on the phenology, natural geographical distribution range and taxonomy of *Aloe dichotoma* (Aloaceae). *Bradleya* 23: 17–22.

SMITH, G.F. & STEYN, E.M.A. 2005b. Notes sur *Echium simplex* (Boraginaceae), une endémique des Iles Canaries naturalisée en Afrique du Sud. *Succulentes* 28,1: 21–25.

SMITH, G.F., STEYN, E.M.A. & CROUCH, N.R. 2005. *Aloe affinis* (Aloaceae). *Curtis's Botanical Magazine* 22: 95–99, t. 524.

SMITH, G.F., VAN WYK, A.E., LUCKOW, M. & SCHRIRE, B. 2006. Conserving *Acacia* Mill. with a conserved type. What happened in Vienna? *Taxon* 55: 223–225.

SMITH, T.J. 2005. *Important plant areas in southern Africa.* Combined Proceedings of Workshops held in Mozambique, Namibia and South Africa. Southern African Botanical Diversity Network Report No. 39.

SMITHIES, S.J. 2005-10. *Felicia amelloides* (L.) Voss. (Asteraceae). Internet 6 pp. http://www.plantzafrica.com/plantefg/feliciamell.htm.

SNIJMAN, D.A. 2005a. Three new species and a new synonym in *Strumaria* (Amaryllidaceae: Amaryllideae) from southern Africa. *Bothalia* 35: 21–27.

SNIJMAN, D.A. 2005b. A new species of *Namaquanula* (Amaryllidaceae: Amaryllideae) from Namibia with notes on the genus. *Bothalia* 35: 153–156.

SNIJMAN, D.A. 2005-04. *Brunsvigia* Heist. (Amaryllidaceae). Internet 4 pp. http://www.plantzafrica.com/plantab/brunsvig.htm.

SNIJMAN, D.A. 2005-08. *Haemanthus* L. (Amaryllidaceae). Internet 5 pp. http://www.plantzafrica.com/planthij/haemanthus.htm.

SNIJMAN, D.A., DUNCAN, G.D. & THOMAS, V. (Artist). 2005. *Haemanthus nortieri* (Amaryllidaceae). *Flowering Plants of Africa* 59: 14–20, t. 2203.

SNIJMAN, D.A. & VICTOR, J. 2005 (2003–2004). Threatened Amaryllidaceae of South Africa. *Herbertia* 58: 91–108.

STEENKAMP, Y. 2005a. Terminal evaluation of the SABONET Project. *SABONET News* 9: 70.

STEENKAMP, Y. 2005b. SABONET Steering Committee concludes business. *SABONET News* 9: 78.

STEENKAMP, Y. 2005c. New books from SABONET. *SABONET News* 9: 79–81, 84.

STEENKAMP, Y. & DE VOS BELGRAVER, C. (eds). 2005a. *SABONET News* 9. Southern African Botanical Diversity Network, Pretoria.

STEENKAMP, Y. & DE VOS BELGRAVER, C. 2005b. Letter from the editors. *SABONET News* 9: 3.

STEENKAMP, Y., SIEBERT, S.J., SMITH, G.F., HUNTLEY, B.J. & WILLIS, C.K. 2006. *Final Project Report. Looking back on the SABONET Project: a triumph of regional cooperation.* Southern African Botanical Diversity Network Report No. 43. SABONET, Pretoria.

STEENKAMP, Y. & SMITH, T.J. 2005. The paper chase. *SABONET News* 9: 85–91.

STEENKAMP, Y., VAN WYK, A.E., SMITH, G.F. & STEYN, H. 2005. Floristic endemism in southern Africa: a numeric classification at generic level. In I. Friis & H. Balslev, Plant diversity and complexity patterns. Local, regional and global dimensions. *Biologiske Skrifter* 55: 253–271. The Royal Danish Academy of Sciences and Letters, Copenhagen.

STEYN, E.M.A., VAN WYK, A.E. & SMITH, G.F. 2005a. Ovule-to-seed development in *Dovyalis caffra* (Salicaceae: Flacourtiaceae) with notes on the taxonomic significance of the extranucellar embryo sac. *Bothalia* 35: 101–108.

STEYN, E.M.A., VAN WYK, A.E., & SMITH, G.F. 2005b. Ovule and seed structure in *Scolopia zeyheri* (Scolopieae), with notes on the embryology of Salicaceae. *Bothalia* 35: 175–183.

STOCK, W.D., LUDWIG, F., MORROW, C. & MIDGLEY, G.F., WAND, S.J.E., ALLSOPP, N. & BELL, T. 2005. Long-term effects of elevated atmospheric CO_2 on species composition and productivity of a southern African C_4 dominated grassland in the vicinity of a CO_2 exhalation. *Plant Ecology* 178: 211–224.

SWELANKOMO, N. 2005-11. *Helichrysum foetidum* (L.) Moench (Asteraceae). Internet 4 pp. http://plantzafrica.com/planthij/helichryfoet.htm.

SYMMONDS, R. & CROUCH, N. 2005. *Warburgia salutaris.* In G. Nichols, *Growing rare plants: a practical handbook on propagating the threatened plants of southern Africa*: 86, 87. Southern African Botanical Diversity Network Report No. 36. SABONET, Pretoria.

TARR, B.B. 2005a. *Apodytes dimidiata.* Tree of the issue. *Urban Green File* 10,5: 56.

TARR, B.B. 2005b. *Clivia gardenii*, autumn's delight. *Clivia* 7: 63–66.

TARR, B.B. 2005-10. *Tridactyle bicaudata* (Lindl.) Schltr. subsp. *bicaudata* (Orchidaceae). Internet 3 pp. http://www.plantzafrica.com/planttuv/tridactbicaud.htm.

TARUS, P.K., COOMBES, P.H., CROUCH, N.R., MULHOLLAND, D.A. & MOODLEY, B. 2005. Furoquinoline alkaloids from the southern African Rutaceae *Teclea natalensis*. *Phytochemistry* 66: 703–706.

THUILLER, W., BROENNIMANN, O., HUGHES, G.O., ALKEMADE, J.R.M., MIDGLEY, G.F. & CORSI, F. 2006. Vulnerability of African mammals to anthropogenic climate change under conservative land transformation assumptions. *Global Change Biology* 12: 424–440.

THUILLER, W., LAVOREL, S., ARAÚJO, M.B., SYKES, M.T. & PRENTICE, I.C. 2005. Climate change threats to plant diversity in Europe. *Proceedings of the National Academy of Sciences of the United States of America* 102: 8245–8250.

THUILLER, W., MIDGLEY, G.F., HUGHES, G.O., BOMHARD, B., DREW, G., RUTHERFORD, M.C. & WOODWARD, F.I. 2006. Endemic species and ecosystem sensitivity to climate change in Namibia. *Global Change Biology* 12: 759–776.

THUILLER, W., RICHARDSON, D.M., PYSEK, P., MIDGLEY, G., HUGHES, G.O. & ROUGET, M. 2005. Niche-based modelling as a tool for predicting the risk of alien plant invasions at a global scale. *Global Change Biology* 11: 2234–2250.

TOLLEY, K.A., BURGER, M., TURNER, A.A. & MATTHEE, C.A. 2006. Biogeographic patterns and phylogeography of dwarf chameleons (*Bradypodion*) in an African biodiversity hotspot. *Molecular Ecology* 15: 781–793.

UNWIN, M., BAYER, R., WARD, J., BREITWIESER, I. & KOEKEMOER, M. 2005. Abstract: A global molecular phylogeny of the Gnaphalieae (Asteraceae). *XVII International Botanical Congress, Vienna, Austria, 17–23 July*, 2005: 115.

VAN DER WALT, L. 2005-07. *Myrsine africana* L. (Myrsinaceae). Internet 3 pp. http://www.plantzafrica.com/plantklm/myrsinafr.htm.

VAN DER WALT, L. 2005-10. *Lobostemon fruticosus* (L.) H.Buek (Boraginaceae). Internet 4 pp. http://www.plantzafrica.com/plantklm/lobostemfrut.htm.

VAN DER WALT, L. 2005-12. *Arctotis stoechadifolia* P.J Bergius (Asteraceae). Internet 4 pp. http://www.plantzafrica.com/plantab/arctotstoech.htm.
VAN JAARSVELD, E.J. 2005a. Vra vir Ernst. *Beeld* weekly article.
VAN JAARSVELD, E.J. 2005b. Vra vir Ernst. *Buite Burger* (Western Cape) weekly article.
VAN JAARSVELD, E.J. 2005c. *Kleinia venteri*, a new succulent species from Limpopo Province. *Aloe* 42: 12, 13.
VAN JAARSVELD, E.J. 2005d. Review: Gardening the Mediterranean way, by H. Gildemeister. *Veld & Flora* 91: 148.
VAN JAARSVELD, E.J. 2005e. Succulent plants in copper. *Aloe* 42: 43–47.
VAN JAARSVELD, E.J. 2005-05. *Gasteria acinacifolia* (J.Jacq.) Haw. (Asphodelaceae). Internet 3 pp. http://www.plantzafrica.com/gasteracina.htm.
VAN JAARSVELD, E.J. 2005-08. *Bulbine latifolia* (L.f.) Roem. et Schult. (Asphodelaceae). Internet 3 pp. http://www.plantzafrica.com/plantab/bulbinlati.htm.
VAN JAARSVELD, E.J. 2005-09. *Stoeberia arborea* Van Jaarsv. (Mesembryanthemaceae). Internet 3 pp. http://www.plantzafrica.com/plantqrs/stoebarbor.htm.
VAN JAARSVELD, E.J., CARRS, S., EMS, P., HURTER, J., SWANEPOEL, W. & VOIGT, W. 2005. The Slangkloof Expedition. *Veld & Flora* 91: 172–177.
VAN JAARSVELD, E.J., HAMMER, S. & VAN WYK, A.E. (Braam). 2005. *Bulbine retinens*, a new cliff-dweller from the Eastern Cape. *Aloe* 42: 14, 15.
VAN JAARSVELD, E.J. & VAN WYK, A.E. 2005a. Two new succulent cliff-dwelling species of *Drimia* (Hyacinthaceae) from the Eastern Cape, South Africa. *Aloe* 42: 53–55.
VAN JAARSVELD, E.J. & VAN WYK, A.E. 2005b. *Aeollanthus rydingianus*, a new species from northern Namibia and southern Angola (Lamiaceae). *Bothalia* 35: 157–160.
VAN JAARSVELD, E.J. & VAN WYK, A.E. 2005c. *Gasteria tukhelensis*, a new species from KwaZulu-Natal, South Africa (Asphodelaceae). *Bothalia* 35: 164–166.
VAN JAARSVELD, E.J. & VAN WYK, A.E. 2005d. *Ornithogalum juncifolium* var. *emsii*, a new cliff-dwelling *Ornithoglum* from Eastern Cape, South Africa (Hyacinthaceae). *Bothalia* 35: 82–84.
VAN JAARSVELD, E.J. & VAN WYK, A.E. 2005e. *Oscularia cremnophila*, a rare new species from Western Cape, South Africa (Mesembryanthemaceae). *Bothalia* 35: 160–163.
VAN JAARSVELD, E.J. & VAN WYK, A.E. 2005f. A new cliff-dwelling *Bulbine* species (Asphodelaceae) from the Eastern Cape. *Aloe* 42: 48–51.
VAN JAARSVELD, E.J. & VAN WYK, A.E. 2005g. A new subspecies of *Aloe arborescens* from the Mzimnyati River, KwaZulu-Natal. *Aloe* 42: 40–42.
VAN JAARSVELD, E.J., VAN WYK, A.E. & CONDY, G. (Artist). 2005. *Aloe omavandae* (Asphodelaceae). *Flowering Plants of Africa* 59: 2–6, t. 2201.
VAN WYK, A.E., SMITH, G.F. & STEENKAMP, Y. 2005. Plant endemism in southern Africa and the identification of priority areas for conservation. In T.J. Smith, *Important plant areas in southern Africa*: 8–12. Southern African Botanical Diversity Network Report No. 39.
VAN WYK, A.E. & SMITH, G.F. 2005. Hertipifisering van *Acacia*: uitslag van stemming in Wenen. *Dendron* 37: 5–7.
VAN WYK, B-E., SMITH, G.F., VILJOEN, A.M., TREUTLEIN, J. & WINK, M. 2005. Abstract: Secondary metabolites in relation to molecular phylogenies in *Aloe* and related genera (family Asphodelaceae). *Abstracts of the International Botanical Congress* 17: 36. Vienna, Austria.
VILE, D., GARNIER, E., SHIPLEY, B., LAURENT, G., NAVAS, M-L., ROUMET, C., LAVOREL, S., DÍAZ, S., HODGSON, J.G., LLORET, F., MIDGLEY, G.F., POORTER, H., RUTHERFORD, M.C., WILSON, P.J. & WRIGHT, I.J. 2005. Specific leaf area and dry matter content estimate thickness in laminar leaves. *Annals of Botany* 96: 1129–1136.
VILJOEN, C. 2005-04. *Senecio tamoides* DC. (Asteraceae). Internet 3 pp. http://www.plantzafrica.com/plantqrs/senectam.htm
VILJOEN, C. 2005-09. *Cliffortia ferruginea* L.f. (Rosaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/cliffortfer.htm.
VILJOEN, C. 2005-09. *Nylandtia spinosa* (L.) Dumort. (Polygalaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/nylandspin.htm.
VILJOEN, C. 2005-11. *Ekebergia pterophylla* (C.DC.) Hofmeyr (Meliaceae). Internet 3 pp. http://www.plantzafrica.com/plantefg/ekebergptero.htm.
VOIGT, W. 2005-07. *Aloe perfoliata* L. (Asphodelaceae). Internet 4 pp. http://www.plantzafrica.plantab/aloeperfol.htm.
VOIGT, W. 2005-08. *Kalanchoe thyrsiflora* Harv. (Crassulaceae). Internet 3 pp. http://www.plantzafrica.com/plantklm/kalanthyrs.htm.
VOIGT, W. 2005-10. *Crassula multicava* Lem. (Crassulaceae). Internet 4 pp. http://www.plantzafrica.com/plantcd/crassmulticav.htm.
VOIGT, W. 2005-11. *Ruschia* Schwantes (Mesembryanthemaceae). Internet 7 pp. http://www.plantzafrica.com/plantqrs/ruschia.htm.
VON WITT, C.G. 2006. Rare plants discovered in Ratelrivier wetland. *Village Life* 16: 3, 4.
VON WITT, C.G. 2006-03. *Mimetes hirtus*. Internet. http://www.plantzafrica.com/plantklm/mimehirt.htm.
WELMAN, M. 2005-05. *Momordica cardiospermoides* Klotzsch (Cucurbitaceae). Internet 3 pp. http://www.plantzafrica.com/plantklm/momordcard.htm.
WELMAN, M. 2005-06. *Lagenaria siceraria* (Mol.) Standl. (Cucurbitaceae). Internet 4 pp. http://www.plantzafrica.com/plantklm/lagensic.htm.
WELMAN, M. 2006-03. *Trochomeria macrocarpa* (Sond.) Hook.f. (Cucurbitaceae). Internet 3 pp. http://www.plantzafrica.com/planttuv/trochommacro.htm.
WELMAN, M. 2006. Climbers and scramblers in southern African *Senecio* and allied genera. *PlantLife* 32: 21–26.
WELMAN, M. & CONDY, G. (Artist). 2005. *Ipomoea ommanneyi* (Convolvulaceae). *Flowering Plants of Africa* 59: 108–112, t. 2216.
WILLIAMS, P., HANNAH, L., ANDELMAN, S., MIDGLEY, G.F., ARAUJO, M., HUGHES, G., MANNE, L., MARTINEZ-MEYER, E. & PEARSON, R. 2005. Planning for climate change: identifying minimum-dispersal corridors for the Cape Proteaceae. *Conservation Biology* 19: 1063–1074.
WILLIAMSON, G. & KURZWEIL, H. 2005. Orchidaceae. In J.E. Burrows & C.K. Willis, *Plants of the Nyika Plateau: an account of the vegetation of the Nyika National Parks of Malawi and Zambia*: 314–338. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria.
WILLIS, C.K. 2005a. National Botanical Gardens: embassies of South Africa's biodiversity and culture. *BGCI BGjournal* 2,2: 9–12.
WILLIS, C.K. 2005b. News from South Africa's National Botanical Gardens: December 2004 to November 2005. *African Botanic Gardens Network Bulletin*, Nov.: 8–12.
WILLIS, C.K. 2005c. Introduction and botanical exploration. In J.E. Burrows & C.K. Willis, *Plants of the Nyika Plateau: an account of the vegetation of the Nyika National Parks of Malawi and Zambia*: 1–17. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria.
WILLIS, C.K. (ed.) 2006a. Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1. South African National Biodiversity Institute, Pretoria.
WILLIS, C.K. 2006b. Introduction. In C.K. Willis, Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 2–11. South African National Biodiversity Institute, Pretoria.
WILLIS, C.K. 2006c. Providing models with protocols for plant conservation. In C.K. Willis, Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 19, 20. South African National Biodiversity Institute, Pretoria.
WILLIS, C.K. 2006d. SANBI: Institutional response to implementing the International Agenda. *BGCI BGjournal* 3,1: 11–13.
WILLIS, C.K., SMITH, G.F. & OLIVER, I. 2006. From Whitehill to Worcester. *Veld & Flora* 92: 34–39.
WILLIS, C.K. & VAN WYK, E. 2006. Integrating *ex situ* and *in situ* conservation. In C.K. Willis, Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation. *SANBI Biodiversity Series* 1: 35–39. South African National Biodiversity Institute, Pretoria.
WINTER, J. 2005-04. *Encephalartos villosus* Lem. (Zamiaceae). Internet 3 pp. http://www.plantzafrica.com/plantefg/encephvill.htm.
WINTER, J. 2005-12. *Clivia caulescens* R.A.Dyer. (Amaryllidaceae). Internet 3 pp. http://www.plantzafrica.com/plantcd/cliviacaul.htm.
WINTER, P.J.D. 2005. Acanthaceae, Apiaceae, Crassulaceae, Lamiaceae. In J.E. Burrows & C.K. Willis, *Plants of the Nyika Plateau: an account of the vegetation of the Nyika National*

Parks of Malawi and Zambia: 48–67, 133–135, 183–192. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria.

WINTER, P.J.D. 2005-09. *Ceratotheca* sp. aff. *reniformis* Abels (Pedaliaceae). Internet 3 pp. http://www.plantzafrica.plantcd/ceratothecspafren.htm.

WINTER, P.J.D. & VAN JAARSVELD, E.J. 2005. *Plectranthus porcatus*, a new species endemic to the Sekhukhuneland Centre of Plant Endemism, Limpopo Province, South Africa (Lamiaceae). *Bothalia* 35: 169–173.

WOLFSON, M. 2005a. Challenges and gaps in developing and implementing national legislation on access and benefit-sharing in South Africa. *International Expert Workshop on Access to Genetic Resources and Benefit-sharing (ABS) Cape Town, South Africa, 20–23 September 2005*: 45–50. Norwegian Ministry of the Environment.

WOLFSON, M. 2005b. Review: Seeds conservation: turning science into practice, edited by R.D. Smith, J.B. Dickie, S.H. Linington, H.W. Pritchard & R.J. Probert, 2003. *Bothalia* 35: 111–113.

XABA, A. 2005-04. *Rapanea melanophloeos* (L.) Mez (Myrsinaceae). Internet 3 pp. http://www.plantzafrica.com/plantqrs/rapanmelan.htm.

XABA, A. 2005-09. *Prionium serratum* (L.f.) Drège ex E.Mey. (Prioniaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/prionserr.htm.

XABA, A. 2005-12. *Pseudoselago serrata* (P.J.Bergius) Hilliard (Scrophulariaceae). Internet 3 pp. http://www.plantzafrica.com/plantnop/pseudoselser.htm.

ZONNEVELD, B.J.M. & VAN JAARSVELD, E.J. 2005. Taxonomic implications of genome size for all species of the genus *Gasteria* Duval (Aloaceae). *Plant Systematics and Evolution* 251: 217–227.