



**AGRICULTURAL RESEARCH COUNCIL**  
PLANT PROTECTION RESEARCH INSTITUTE  
P/Bag X134, Queenswood, Pretoria 0121

# FINAL REPORT

**SURVEYS OF ALIEN WEEDS AND INVASIVE PLANTS  
IN SOUTH AFRICA  
- SOUTHERN AFRICAN PLANT INVADERS ATLAS  
(SAPIA) PHASE II**

PREPARED BY:

Ms. L. Henderson

Tel: (012) 843 5035 Fax: (012) 804 3211

Email: [L.Henderson@sanbi.org.za](mailto:L.Henderson@sanbi.org.za)

PREPARED FOR:

Client: Working for Water Programme (DWA WfW)

Contact person: Mr. A. Wannenburg

Tel: (021) 441 2700 Fax: (021) 441 2751

Email: [WannenburgA@dwa.gov.za](mailto:WannenburgA@dwa.gov.za)

MARCH 2010

(c) Agricultural Research Council 2010

The content of this document may constitute valuable Intellectual Property, and is confidential. It may not be read, copied, disclosed, or used in any other manner by any person other than the addressee(s), and specifically not disclosed to another party outside of this contract. Unauthorised use, disclosure, or copying is strictly prohibited and unlawful.

## TABLE OF CONTENTS

	Page
1. INTRODUCTION .....	2
2. TERMS OF REFERENCE .....	3
3. DURATION OF PROJECT .....	3
4. ORIGINAL PROJECT PLAN.....	3
5. PROJECT BUDGET.....	3–4
6. SUMMARY OF RESULTS .....	4
Redesign of SAPIA database and integration into AGIS .....	4
SAPIA II.....	4
Extension to rest of Africa.....	5
SANBI's Early Detection & Rapid Response of IAPs.....	5
Surveys of IAPs.....	5–6
Important findings.....	6
Distribution and status of <i>Campuloclinium macrocephalum</i> (pompom weed).....	7–8
New and emerging species.....	8
recorded during SAPIA surveys.....	8–12
recorded by the public or SANBI's ED & RR teams.....	12–16
Update of records in the SAPIA database.....	16–17
7. NOTABLE ACHIEVEMENTS .....	17
8. PROBLEMS AND CONSTRAINTS .....	17
9. ADDITIONAL RESEARCH NEEDS .....	18
10. FINANCIAL REPORT .....	18
11. PUBLICATIONS .....	18–19
12. GENERAL .....	19
13. DATA .....	19
14. APPENDIX .....	
Table 1. New species added to the SAPIA database .....	20–22
SAPIA News No. 14, January 2010.....	23

## 1. INTRODUCTION

**Background**

The Southern African Plant Invaders Atlas (SAPIA) database is the most comprehensive database on invasive alien plants (IAPs) in South Africa. To date it contains 69 818 locality records of approximately 660 naturalized alien plant species in 1 500 ¼ ° squares in South Africa, Swaziland and Lesotho. The records span a period of 31 years. Information has been obtained from roadside surveys done by L Henderson (1979+) and the SAPIA project (phase I: 1993–1998; phase II: 2005+), co-ordinated by L Henderson.

The distribution data in the SAPIA database have provided baseline information for national projects on IAPs, such as the Working for Water (WfW) Programme. It has also played a crucial role in providing information on IAPs for the revision of the Conservation of Agricultural Resources Act, Act 43 of 1983 (CARA), and the drafting of the National Environmental Management: Biodiversity Act, Act 10 of 2004 (NEMBA). In 1998 the SAPIA database was identified at a workshop commissioned by the Department of Agriculture as the starting point for the development of a national information system for the management of IAPs. It was incorporated into AGIS (Agricultural Geo-referenced Information System) in 2000 but only a limited amount of information could be accessed at the Weeds and Invasive Plants website. It was clear that the functionality of the SAPIA database and access to data needed to be improved.

Alien plant invasion is a dynamic process and therefore it is essential that the SAPIA database be kept up-to-date with current information. The SAPIA project can play an important role in the awareness and detection of emerging weeds.

This is the final report and covers the project from 1 April 2005 to 15 March 2010.

## 2. TERMS OF REFERENCE

### Key objectives:

- To continue surveys of IAPs in South Africa started by L. Henderson in 1979 and which form the basis of the SAPIA database. **Particular emphasis will be placed on emerging weeds and proposed weeds and invaders under the Conservation of Agricultural Resources Act (CARA) and National Environmental Management: Biodiversity Act (NEMBA) but which require further information before they can be listed.**
- To provide baseline information which is needed for the revision of the invasive plant species listed under the CARA and NEMBA Acts, such as invasive status, distribution and correct identification.
- To launch a second phase of the Southern African Plant Invaders Atlas (SAPIA) project.
- To incorporate all the distribution data into the SAPIA computerised database.
- To redesign and improve the functionality of the SAPIA database.
- To make all the SAPIA information accessible to the broad public via the internet at the Weeds and Invasive Plants website within AGIS

## 3. DURATION OF PROJECT

1 April 2005 – 31 March 2010

## 4. ORIGINAL PROJECT PLAN

### Methodology and responsibility

- A second phase of the SAPIA project will be modelled on the first phase but should provide for the electronic submission of data, by e-mail and the internet. Newsletters should be electronic. (L. Henderson and database assistant/manager).
- Participation will again be encouraged from the general public, national and provincial Departments of Agriculture, Environment Affairs, Conservation etc. **Working for Water field staff should form an integral part of the project** (L. Henderson and publicity assistant, WfW liaison officer)
- Roadside surveys will be conducted throughout South Africa using the survey techniques developed by L. Henderson. These surveys are crucial to ensure that within the five year duration of phase II of SAPIA that data is collected from across the country. (L. Henderson (national co-ordinator) and field assistant; regional/provincial co-ordinators with assistants)
- The data will be incorporated into the SAPIA database and AGIS (L Henderson and database assistant/manager)
- Improve functionality of SAPIA database and access to data (database assistant/manager)

### Deliverables

1. Redesign and improve functionality of SAPIA database. Date of completion: 31 December 2005.
2. Launch new phase of SAPIA. Publicity for project. Date of completion: 31 December 2005.
3. Surveys of invasive plants in South Africa. Electronic incorporation into the SAPIA computerised database and AGIS. Date of completion: 31 March 2010.
4. SAPIA phase II launched from January 2006. Date of completion: 31 March 2010.

### Deviations from original project plan

Unavoidable delays in starting the redesign of the SAPIA database (reported in March 2006) and further problems encountered by the AGIS developers resulted in a shift in the goals by more than 12 months.

## 5. PROJECT BUDGET

Project duration: 5 years

R368 000 for the 2005/2006 financial year;  
R392 008 per year for 2006/2007 – 2009/2010

## 1. SUMMARY OF RESULTS

### Redesign of the SAPIA database and integration with AGIS

The redesign of the SAPIA database and its integration with AGIS was led by Dirk Craigie of ARC-ISCW, in his capacity as AGIS Chairman, until his resignation in December 2006.

Over the five year period of the project the following was accomplished:

- All the SAPIA data collected up to March 2010 has been incorporated into the SAPIA Database. SAPIA data up to October 2007 has been incorporated into AGIS.
- SAPIA distribution data (at the ¼ degree (15 minute) square level ) is accessible at the Weeds and Invasive plants website on AGIS ([www.agis.agric.za/wip](http://www.agis.agric.za/wip)) for all species
- AGIS has provided L. Henderson with direct access to the SAPIA data at WIP where the records can be managed online.
- Herbarium fact sheets, photographs and line drawings have been entered for approximately 260 species, which includes all declared species under CARA (2001).
- Six standardized reports have been made available at WIP—these are:
  - Species lists per southern African country (RSA, Lesotho, Swaziland, Angola, Botswana, Zimbabwe, Zambia, Mozambique, Malawi),
  - Species lists per province in South Africa
  - Species lists per ¼ degree square
  - Lists of ¼ degree squares per species
  - Mini reports for all species – Fields listed are: date of observation, ¼ degree square, latitude and longitude co-ordinates, accuracy, locality description, abundance, habitats invaded and notes
  - Mini reports for all ¼ degree squares – all invasive species are listed alphabetically with the corresponding information listed as for ‘mini report per species’.
- A user-friendly template for public submission of records has been made available at the WIP website since August 2007—these records will be held in a holding file until verified by L. Henderson. To date few records have been submitted by the public online.
- A template for submission of batches of records has also been made available.

Problems with AGIS:

- Since May 2008 the DoA firewall has prevented:
  - the online uploading of batches of data into AGIS
  - editing of species information in the virtual herbarium
  - submission of images attached to records at the public WIP website

### SAPIA II

Due to delays in making the Weeds and Invasive Plants website ready for online data submission, the SAPIA II project involving public participation was delayed until January 2007.

The SAPIA II project was announced at the Biological Control of Weeds Workshop in May 2006. The project and its objectives were presented to about 60 participants from various organizations and institutions, including Working for Water, National Department of Agriculture, PPRI, Universities of Cape Town, Grahamstown and Witwatersrand.

Over the five year period of SAPIA II a total of 14 SAPIA Newsletters were posted on the WIP website; one every quarter. These newsletters highlighted invasive and emerging invasive species throughout South Africa; progress with the CARA and NEMBA legislation, and two issues provided keys to the invasive *Acacia* (SAPIA News No. 8) and *Eucalyptus* spp. (SAPIA News No. 12) (see the Appendix for an example of one of these newsletters). The newsletter distribution list has grown to approximately 450 recipients. These newsletters have been well received and each newsletter attracts more subscribers. Many subscribers in turn send the

newsletter to more people, thus vastly increasing the total reader network. Agriforum, at the request of Dr Guy Preston, has agreed to distribute the newsletter to its various affiliates. They have offered to publish an article on the subject in their bi-monthly magazine with a distribution list of 30 000 members. Suggestions have been made to increase the distribution list to all those on the various WfW distribution lists. This however will require the newsletter to be registered with a service provider and will increase the costs of distribution.

In 2007 WfW through separate funding reprinted 2000 copies of the ARC- PPRI Handbook No. 12 'Weeds and invasive plants' to assist SAPIA participants in the identification of invasive species. In the latter part of 2009 a further 2000 copies of the book were printed. However, it can not be said that this resulted in more public participation in the project.

**Extension of SAPIA project to the rest of Africa:**

There has been much interest expressed in the extension of the SAPIA project to the rest of Africa. There have been many attempts in the past to establish a SADC database on IAPs but so far nothing has been achieved. The logical step would be to extend AGIS/WIP to the SADC region and to the whole of Africa. Mr. Arne Witt, previously Weeds Division Head, ARC-PPRI, is now stationed in Nairobi, Kenya, and is the CABI coordinator for Invasive Species in East Africa. Mr Witt is very keen to promote the establishment of regional centres for the control of IAPs in West, East and North Africa. He says that the extension of AGIS/WIP to the rest of Africa could make this possible. A proposal for additional funding of the SAPIA project has been submitted to both DoA and WfW for their consideration.

**SANBI's ED & RR project:**

The South African National Biodiversity Institute (SANBI) launched a new project on the **Early Detection & Rapid Response (ED & RR)** of Emerging IAPs in 2008. The project is funded by Working for Water. The National Co-ordinator of the project is Philip Ivey, stationed at Kirstenbosch in Cape Town. Three regional co-ordinators have been stationed in Cape Town, Durban and Pretoria. The SAPIA project should become an integral part of the new project and hopefully all information on the distribution of emerging invasive alien plant species will be captured in the SAPIA database and will be accessible online at the Weeds and Invasive Plants website. A proposal for the extension of the SAPIA project and its alignment with the early detection project has been submitted to WfW.

**Surveys of invasive plants in South Africa**

From April 2005 to January 2010 SAPIA roadside surveys were conducted in parts of all provinces (see Figure 1). Most emphasis was on the eastern half of South Africa where invasion is most prevalent. A total of 457 ¼ degree squares and 1 402 five minute squares were sampled, generating 12 407 locality records.

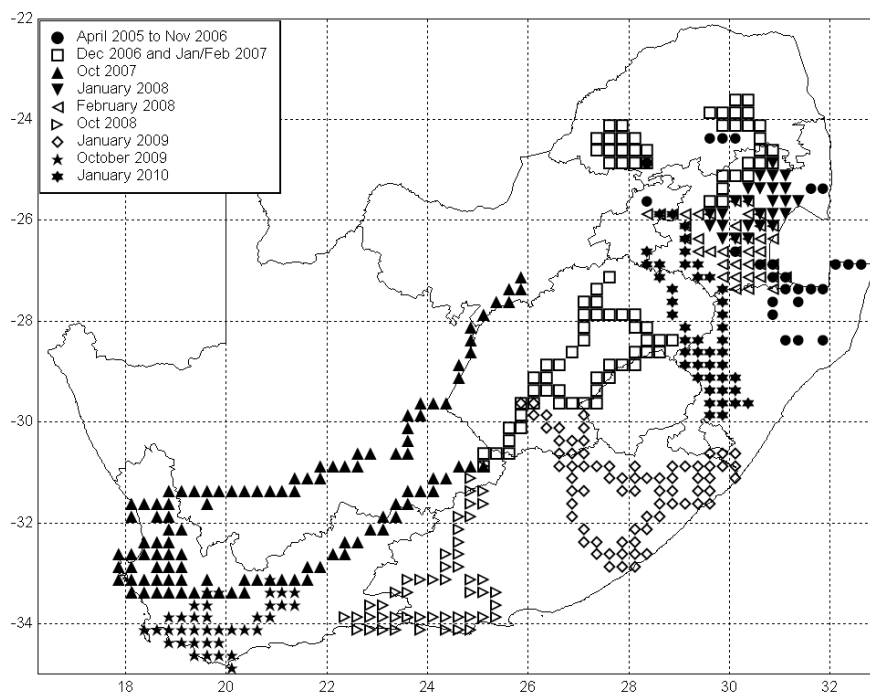


Figure 1. ¼ degree square coverage of SAPIA records from roadside surveys from April 2005 to January 2010.

#### Important findings:

- 106 species have been added to the SAPIA database in the past five years bringing the total number of species to ± 660. (Table 1 in Appendix).
- Most newly recorded IAPs are ornamentals and were located close to habitation, plantings, along roads, rivers and in disturbed sites. Surveys done in the KZN northern reserves and other protected areas highlighted the sources and routes of entry of IAPs into our natural areas. Many species have been deliberately cultivated in protected areas and staff are generally unaware of the threat they pose.
- Some parts of the country were re-surveyed after almost 20 years revealing considerable increases in the numbers of species and their abundances:
  - noticeable increases in the number of species recorded per ¼ degree square were found, for example, at Haenertsburg in Limpopo Province, where 31 new species were added to the 44 already listed in 2329DD; in the Clarens/Ficksburg area of Free State 15 new species were added to the 29 already listed for 2828CB
  - some species have greatly extended their distributions and become more abundant e.g. *Lantana camara*, bugweed (*Solanum mauritianum*) and inkberry (*Cestrum laevigatum*) in the W Cape.
- In February 2006 a major discovery was made of a submerged aquatic weed, *Hydrilla verticillata*, at the Pongolapoort Dam in the Pongola North Reserve in KZN. This is not the first record of this species in southern Africa. An examination of herbarium specimens in the Pretoria National Herbarium (PRE) revealed that hydrilla was first recorded, but misidentified as *Egeria densa*, in South Africa in 1963 when it was reported as a problem in a fish pond at the Tongaat Sugar Estates. The first record of hydrilla in southern Africa was in Mozambique in 1961.
- The alarming spread of *Echinopsis spachiana* (torch cactus) in the Karoo. This columnar cactus has been planted in most towns and at farm homesteads. It is spread by birds and

possibly other animals, and is found along fence lines, under bushes, along watercourses and on rocky hillsides. It is much more abundant than in the last survey conducted in this area about 20 years ago. It has the potential to become as much of a pest as *Opuntia ficus-indica* (prickly pear) if nothing is done to stop its spread. There is an urgent need for biocontrol and possibly *Hypogeococcus festerianus* (mealy bug), which has been released on *Cereus jamacaru* and *Harrisia martinii*, might be of use. Perhaps *H. festerianus* could be released in the interim while a search is made for a host specific mealy bug in its native range in South America.

- *Tamarix* spp. (tamarisks) and *Atriplex nummularia* (old man saltbush) continue to spread along watercourses in the dry interior. Examination of specimens by Dr C. Bredenkamp of SANBI in Pretoria has revealed that the tamarisks are mainly hybrids between the indigenous species (*T. usneoides*) and alien species. This could be a complicating factor if biocontrol was ever considered.
- More attention should be paid to invasive grasses particularly in the W Cape where they are invading fynbos and succulent karoo—these include species of *Avena*, *Bromus* and *Hordeum*. *Pennisetum setaceum* (fountain grass) continues to spread. In parts of the Karoo it extends for many kilometres on road verges and in places it is spreading into adjacent veld and watercourses. Other grasses of concern include *Glyceria maxima* (reed sweet grass), which has invaded streamsides and wetlands in KZN; and *Paspalum quadrifarium* (tussock paspalum) which prefers moist sites, valleys, road verges and between plantations (see SAPIA News No.7)
- A new generation of IAPs in the Fynbos of the Western and Eastern Cape threatens to replace the older generation IAPs, many of which have been successfully controlled biologically. These new species are mainly ornamentals, belonging to the families Myrtaceae (with several species of *Callistemon* and *Melaleuca*) and Proteaceae (with species of *Hakea*, *Banksia* and *Telopea*).

#### **Distribution and status of *Campuloclinium macrocephalum* (pompom weed)**

During the five year contract period surveys were undertaken during the flowering time of pompom weed which enabled an assessment of its current status and distribution. Figure 2 shows its current distribution and localities recorded during the SAPIA II project. *Within five years pompom weed has almost doubled its distribution in terms of ¼ degree squares occupied*—having expanded from a known 48 ¼ degree squares in March 2005 to 93 ¼ degree squares in March 2010. New records for 2009/2010 were Champagne Valley in the northern KZN Drakensberg (2929AB), N3 north of Estcourt under bridge at Ultracity, and at Ngome (2731CD). The latter sites were reported to Michael Braack of KZN Department of Agriculture and Environment and the plants have been dealt with as part of the ongoing control of emerging IAPs in the province.

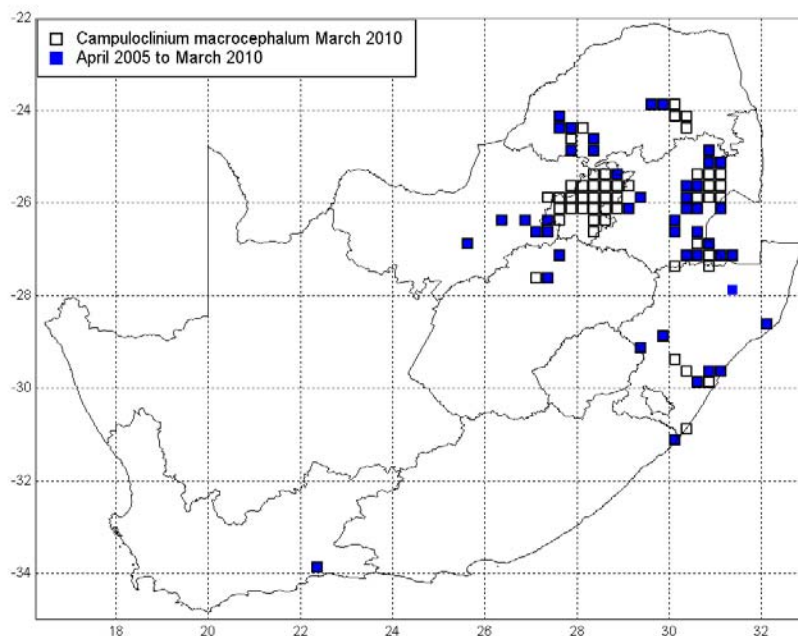


Figure 2. All SAPIA records for pompom weed up to March 2010.

Pompom weed has not been recorded in the Eastern Cape. No plants were seen at Port St Johns despite the SAPIA database having a record from 1998—submitted by Elize Cloete, curator of the University of Transkei Herbarium in Umtata. Elize Cloete was contacted about this anomaly and it was discovered, on inspection of a voucher specimen, that the record was incorrect and was actually for *Chromolaena odorata* (chromolaena).

There is much suitable habitat for pompom weed in the NE Cape and Transkei. *Verbena bonariensis* (purpletop), which is an indicator of suitable habitat, is widespread and abundant in many places. SANBI's emerging weeds team in E Cape must be very vigilant and ensure that pompom is controlled if it is found in the province. The main routes, N2 and R61, leading from KZN must be watched, as well as the N6 coming from Bloemfontein.

### New and emerging species recorded during SAPIA roadside surveys

#### *Limpopo province:*

SAPIA Newsletters Nos. 2 and 3 report on these surveys. Eleven new species were added to the 96 already listed for the Tzaneen 1/4 degree square of 2330CC. Notable species were: *Ipomoea carnea* (bush morning glory), *Lagerstroemia indica* (pride of India), *Leucaena leucocephala* (leucaena), *Spathodea campanulata* (African flame tree) and *Thevetia peruviana* (yellow oleander).

Emerging species of concern include: *Acer buergerianum* (Chinese maple), *Acer negundo* (ash maple), *Prunus serotina* (black cherry), *Lonicera japonica* 'Halliana' (Japanese honeysuckle), *Phormium tenax* (New Zealand flax), *Persicaria capitata* (knotweed), *Hedychium gardnerianum* (kahili ginger lily), *Sambucus* sp. (elder), *Sphagneticola trilobata* (Singapore daisy) and *Bougainvillea glabra* (bougainvillea).

*Tibouchina* sp. (tree tibouchina) and *Lagerstroemia indica* (pride of India) were recorded as garden escapes in the Woodbush, Tzaneen, Haenertsburg and Lekgalameetse areas. A new garden escape recorded in Pilgrim's Rest was *Bauhinia forficata* (thorny orchid tree) – an unusual, very thorny species.

A popular garden cultivar of the indigenous *Crocasmia paniculata* has escaped from cultivation near the Dap Naude Dam in the Woodbush Forestry area. It forms impenetrable stands up to 1.8 m high under pines, along roadsides and in firebreaks between the pines. It



was also seen in several other locations in disturbed grassland and along roadsides. Iridaceae expert John Manning of SANBI at Kirstenbosch says that little is known about this weedy form of *C. paniculata*. He would not list it as an indigenous plant that threatens biodiversity since as far as we know it only invades disturbed habitats – it is not known to invade pristine habitats. It occurs within the normal distribution range of the wild *C. paniculata*. Its parentage is not known nor is it known whether it produces fertile seed. The extensive stands seen near Dap Naude Dam may be the consequence of the mechanical clearing by bull-dozers of the firebreaks in the pine plantations. The plants can reproduce vegetatively from perennial underground corms and rhizomes. It is worth mentioning that *Crococsmia Xcrococsmiiflora*, which is invasive in Australia, is a hybrid between *C. aurea* and *C. paniculata*.

*Chukrasia tabularis* (Indian mahogany) has been established in a plantation near Debengeni Falls in the Magoebaskloof area. There has been some spread from the plantation but the extent is unknown.

#### *Mpumalanga:*

SAPIA Newsletter No. 6 reports on the survey of the escarpment and lowveld. Some very harmful invaders are still relatively scarce or even absent from large areas of Mpumalanga and steps should be taken to curb their spread—these include *Parthenium hysterophorus* (parthenium), *Chromolaena odorata* (triffid weed) and *Ageratina adenophora* (mistflower). The discovery of mistflower near Kaapsehoop was the first record for Mpumalanga and since then it has been recorded from Barberton. Steps should be taken to eradicate these plants. Triffid weed was recorded for the first time in the Schagen Valley, north east of Nelspruit and should be met with the same response.

Other species that are already very invasive in parts of Mpumalanga but have the potential to become much more abundant include: *Cardiospermum grandiflorum* (balloon vine), *Tithonia diversifolia* (Mexican sunflower), *Sambucus canadensis* and *S. nigra* (elderberries), *Tecoma stans* (yellow bells), *Passiflora subpeltata* (granadina), *Canna indica* (Indian shot), *Lilium formosanum* (Formosa lily) and *Pueraria montana* (kudzu vine).

*Spathodea campanulata* (African flame tree) indigenous to East Africa, and a favourite ornamental tree in subtropical areas of South Africa, was recorded as an escape from cultivation in several places. This species is related to the invasive yellow bells, cat's claw creeper and jacaranda and has become very invasive in the tropics outside of Africa. It has been proposed for listing under CARA in Limpopo, Mpumalanga and KwaZulu-Natal.

Mpumalanga highveld (Machadadorp to Wakkerstroom). Invaders in this region that have the potential to spread much more include: *Oenothera jamesii* (giant evening primrose), *Lilium formosanum* (Formosa lily), *Acacia elata* (peppertree wattle), *Pyracantha angustifolia* (yellow firethorn), *Pyracantha* cultivars, *Cotoneaster* spp., *Rosa rubiginosa* (eglantine rose), *Mirabilis jalapa* (four-o'clock), *Cortaderia jubata* pampas grass, *Pennisetum villosum* (feathertop), *Gleditsia triacanthos* (honey locust), *Robinia pseudoacacia* (black locust), *Crotalaria agatiflora* (birdflower), *Sambucus* spp. (elderberries) and *Canna x generalis* (garden canna).

#### *Free State:*

SAPIA News No. 3 reports back on the survey of the eastern Free State. Emerging species include: *Acer negundo* (ash-leaved maple)—quite widespread but only one or a few plants seen at any locality. *Fraxinus pennsylvanica/velutina* (red/velvet ash)—quite widespread and frequent in places; *Ulmus parvifolia* (Chinese elm)—rare to occasional. *Crataegus monogyna* (English hawthorn)—at Ficksburg in a kloof; several plants in full fruit.

Species that have only been recorded in the eastern Free State and Eastern Cape are *Juniperus virginiana* (red cedar) and *Cupressus arizonica* (Arizona cypress). Both species occur in rocky places where they are protected from fire. Red cedar is locally frequent but not yet abundant.

Of interest is the occurrence of *Pinus pinaster* (cluster pine) which is locally invasive in the Ficksburg and Ladybrand Districts. This species has previously only been recorded for the Western and Eastern Cape.

*Cytisus scoparius* (Scotch broom) was recorded for the first time between Harrismith and Warden. It has the potential to spread much more.

#### *KwaZulu-Natal:*

SAPIA News No. 14 reports on the surveys at the foothills of the Drakensberg. Herbarium specimens in PRE indicate that an emerging species, *Hypericum patulum* (goldencup St Johnswort) was recorded as far back as 1982 at Carter's Nek in the southern Drakensberg, on the road between Nottingham Road and Loteni. Many plants were found at this site and beyond, as well as far off on the Bulwer road. It invades roadsides, gullies and forest margins. This might be a species that SANBI's ED & RR team could investigate but it might already have spread too far – and the terrain could make it difficult to treat. There is a question mark about the correct identification.

*Cytisus scoparius* (Scotch broom) was seen only on a couple of occasions. This species has the potential to spread more. It has long been on the CARA list.

Two grasses in particular are of concern in KZN. These are featured in SAPIA News No. 7 and are *Glyceria maxima* (reed sweet grass) and *Paspalum quadrifarium* (tall paspalum). Reed sweet grass has been recorded from a few locations where it invades wetlands and riverbanks. Tall paspalum invades valleys, moist roadsides and plantation edges.

*Quisqualis indica* (Rangoon creeper) is an ornamental creeper that was seen as an escape from cultivation in Ndumu Game Reserve in February 2006. This species has become naturalized in other parts of tropical Africa.

*Grevillea banksii* (Australian crimson oak) is very invasive near Port Edward. This species, from Queensland in eastern Australia, is well adapted to the eastern coastal belt of South Africa. It is a proposed category 1b plant under CARA.

#### *North-eastern Cape and former Transkei:*

SAPIA News No. 11 reports back on this survey. Port St Johns has the largest number of invasive species recorded anywhere in Transkei. The majority of species have been used for ornament and hedging. Emerging species include *Montanoa hibiscifolia* (tree daisy), *Cardiospermum grandiflorum* (balloon vine), *Tecoma stans* (yellow bells), *Hedychium* spp. (ginger-lilies), *Ardisia crenata* (coralberry tree), *Nephrolepis* spp. (sword ferns), *Tibouchina* sp. (tree tibouchina), *Grevillea robusta* (Australian silky oak), *Spathodea campanulata* (African flame tree) and *Araucaria bidwillii* (bunya-bunya).

#### *Karoo:*

SAPIA News No. 9 reports back on some species in the Karoo. Graaff-Reinet is the alien succulent plant capital of the Karoo. Species seen there include *Opuntia ficus-indica* (prickly-pear), *Cylindropuntia imbricata* (= *Opuntia imbricata*) (imbricate cactus), *O. humifusa* (creeping prickly pear), *O. microdasys* (yellow bunny ears) and *Echinopsis spachiana* (torch cactus). Many of these species occur in the vicinity of the newly proclaimed Camdeboo National Park. Emerging species might include both *Cylindropuntia tunicata* (sheathed cholla) and *Cylindropuntia xpallida* (= *C. rosea*) (rosea cactus). Sheathed cholla is low-growing, not more than 50 cm high and has yellowish flowers. Rosea cactus which is a hybrid between sheathed cholla and imbricate cactus can look very similar but has rose-coloured flowers. Barbara Mashope, with SANBI's ED & RR in Cape Town is investigating these species.

*Tephrocactus articulatus* (pine cone cactus) is a widespread emerging ornamental invasive cactus, occurring in the N, E and W Cape. The seed of this species spreads by wind and water.

A new *Opuntia* species seen in cultivation and spreading along the railwayline at Beaufort West has been identified as *O. elata* var. *elata* by Roberto Kiesling in Argentina. It has dark

green, almost purplish cladodes. The cladodes have very few glochids and many cladodes are spineless, while others have spines up to 9 cm long. Flowers are orange, fruits reddish-purple. This species may have been seen elsewhere (at Colesberg in the N Cape and near Christiana on the N12 in NW Province).

*Ranunculus* cf. *ronii* (water crowfoot), which looks similar to *Cabomba caroliniana* (fanwort) and nativity uncertain, was found in the Sundays River north-east of Graaff-Reinet on the Letskraal Road. Water crowfoot can be readily distinguished from fanwort by its alternate, and not opposite, leaves. There are also other floral differences.

*West coast of the W Cape:*

SAPIA News No. 5 reports back on this survey. *Limonium sinuatum* (statice), a native of the Mediterranean, was recorded from Darling northwards to Nieuwoudtville and Calvinia. It is largely confined to roadsides and other disturbed places, but has spread very far outside of towns. It was extremely abundant on all routes in and out of Vanrhynsdorp and provided a carpet of colour in the local succulent nursery in town—a probable source of the escaped plants. Statice was reported to be naturalized on the Cape Peninsula as far back as 1950. Now it is naturalized in a wide area from Yzerfontein on the west coast to Calvinia, Beaufort West and Prince Albert in the karoo, to Silvermine and Hermanus where it invades coastal fynbos. This species warrants listing under CARA – but this will receive opposition from florists that use the species in flower arrangements. Publicity is needed to inform the public that this species is not indigenous and in fact is invasive.

Alien grasses, particularly *Avena* spp. are very widespread and abundant along roadsides from Laingsburg southwards, throughout the west coast and inland to Williston. In places they are invading the natural veld. A proper investigation into invasive grasses will require more time and a change of survey method to allow for frequent stops and collecting of herbarium specimens. In Nieuwoudtville, where a new national botanical garden has been established to conserve the indigenous plant species, alien grasses could be a severe threat.

A previously unrecorded species of prickly poppy was discovered in the Velddrif, Elandsbaai and Redelinghuys areas and has been provisionally identified as *Argemone albiflora* subsp. *texana* (white prickly poppy or bluestem prickly poppy). This species can be distinguished from *A. ochroleuca* and *A. mexicana* (white- and yellow-flowered Mexican poppies) by its very large white flowers which measure 70–90 mm across, its taller and more robust size, and less thorny leaves and stems. It was abundant in abandoned cultivated fields and in places grows side by side with *A. ochroleuca*. Live plants and seed were collected for the biocontrol project on *Argemone*. *A. albiflora* subsp. *texana* is native to North America – Texas, Arkansas, Louisiana and Missouri.

*Southern Cape, including the Garden Route:*

SAPIA News No. 9, October 2008, reports back on the southern Cape survey. Along the Garden Route there are many emerging species including *Hakea salicifolia* (willow hakea) and *Vinca major* (blue periwinkle) which are adapted to the moist, forested conditions, and *Callistemon* spp. (bottlebrushes) which are invading watercourses and wetlands.

*Anredera cordifolia* (Madeira vine) is widespread, usually occurring near habitation where it has invaded surrounding forest and bush. It has the potential to spread much more.

*Hakea salicifolia* (willow hakea) a commonly planted ornamental tree, hedge and windbreak is spreading in many sites from seed, mainly close to habitation. Apparently it does not require fire to release seed from fruits (follicles) and appears to like moist sites. In its native Australia it grows in wet sclerophyll forest and edges of rainforest – habitats that are abundantly available along the Garden Route. This species has been proposed as a declared invader but has not yet been listed since more information was needed about its potential invasiveness.

*Callistemon* spp. (bottlebrushes) are invading wetlands and fynbos in the George, Knysna and Tsitsikamma regions. Their identities still need to be confirmed but are possibly *C. rugulosus* (scarlet or swamp bottlebrush), *C. citrinus* (lemon bottlebrush) and *C. rigidus* (stiff-leaved bottlebrush). The latter two species have already been recognised as potentially

serious invaders and have been proposed as category 1b invaders under CARA and NEMBA in the W and E Cape. *C. viminalis* (weeping bottlebrush) is invading watercourses.

*Vinca major* (blue periwinkle), a popular ornamental groundcover is very abundant along roadsides near habitation but was also seen on the edges of indigenous forest. It has been proposed as a category 1b invader countrywide.

*Cyathea cooperi* (Australian tree fern) is spreading within the Knysna Forest in the Gouba and Goudveld areas. It can be distinguished from the indigenous forest tree fern (*Cyathea capensis*) by the brown, not black, scales on the frond stalks, and the absence of moss-like, reduced fronds in the stem crown which occur in the indigenous species.

Several emerging invasive species were seen on the outskirts of George, and within suburban areas along watercourses. These include *Cinnamomum camphora* (camphor tree), *Kunzea ericoides* (burgan) (all plants treated by WfW; will have to follow up and look for plants in gardens), *Syzygium paniculatum* (Australian brush-cherry) and *Acer negundo* (ash-leaved maple). These plants are bound to spread further afield.

*Echium candicans* (= *E. fastuosum*) (pride-of-Madeira) an ornamental plant with large blue spikes of flowers is a potentially new invasive species. According to Kasey Voges, previously with WfW, this species is coming up in disturbed sites on the outer urban limits.

*Coprosma repens* (mirrorplant) is a popular ornamental that has started spreading away from cultivation. It is dispersed by birds. *Crataegus* cf. *mexicana* (hawthorn) is another ornamental seen as an escape from cultivation at Plettenberg Bay.

#### SW Cape, Overstrand District:

SAPIA News No. 13, October 2009 reports back on this survey. Three or four species of *Callistemon* were reorded, mostly in wetland habitats. These were: *C. viminalis* (weeping bottlebrush), *C. cf. rugulosus* (= *C. macropunctatus*) (scarlet bottlebrush), *C. rigidus* (stiff-leaved bottlebrush), and another unidentified species, close to *C. rigidus*.

*Banksia integrifolia* (common banksia) was recorded as an escape from cultivation in Pringle Bay where it is spreading into disturbed fynbos. A previous record of this species exists in the SAPIA database, for the Farm Honingklip near Kleinmond.

*Melaleuca hypericifolia* (red-flowering tea-tree) is naturalized on the lower slopes of Chapman's Peak near Hout Bay. An invasion of this species was first recorded in 1998 in this area. This trip confirmed that the plants still persist in this area.

*Melaleuca nesophila* (mindiyed) was recorded at Betty's Bay, with seedling spread adjacent to a garden. This species, from Western Australia, has become naturalized in parts of eastern Australia.

#### **New and emerging species reported by the public or SANBI's ED & RR teams**

##### Limpopo:

*Berberis* cf. *chitria* (berberis)–Haenertsburg district; Woodbush State Forest, along watercourse. Still waiting for herbarium specimen with flowers and precise locality and habitat information. (Stuart Perks, Woodbush Plantation, Magoebaskloof)

##### Gauteng:

*Echinopsis chamaecereus* (peanut cactus) – localized escape in Pretoria National Botanical Garden (Pieter Bester, SANBI).

*Euphorbia esula* (leafy spurge)–Hennops River. Apparently the first record of this species in South Africa. In the USA it is said to aggressively compete with native plant communities and to survive chemical, cultural, and mechanical control, thus allowing it to eventually dominate the landscape. It is toxic to most native and domestic livestock. Advised SANBI's ED & RR team, Gauteng to investigate. (Dirk Mans)

NW Province:

*Harrisia balansae* (harrisia)–near Groot Marico, garden escape. Also occurs in the Rust de Winter area but more sparsely. Plants with long clambering stems, 3 - 4 prominent ribs, fruits reddish with bracts and edible pulp. Heavily infected by *Hypogeococcus* (mealybug). Identification confirmed by Roberto Kiesling, although he regards the true identity as *H. bonplandii*. (Dr. Helmuth Zimmermann, previously ARC-PPRI)

*Heimia salicifolia* (willow-leaf heimia) – localized escape in Magaliesberg (Dr. Stefan Nesor, previously ARC-PPRI)

*Salvia coccinea* (scarlet salvia) – localized escape in Magaliesberg (Dr. Stefan. Nesor, previously ARC-PPRI)

KZN:

*Actinidia deliciosa* (Kiwifruit)–Hilton, spread by monkeys. (Cobus Botha, DoA, Pietermaritzburg)

*Aralia spinosa* (devil's walking stick), family Araliaceae, recorded in the Karkloof District in KZN, where it has invaded a felled timber compartment. Devil's walking stick is a small tree native to North America; it spreads by suckering and also from seed. The fleshy berries are attractive to birds which then help to disperse the seed. Other closely related emerging invasive species are *Schefflera actinophylla* (Queensland umbrella tree) and *Hedera helix* (English ivy). (Jeremy Goodall, ARC-PPRI)

*Ardisia elliptica* (shoebutt ardisia)–Durban Berea, Kloof, Westville around habitation. (Geoff Nichols, Durban)

*Callisia repens* (creeping-inch plant)–Durban, Krantzklouf, north and south coast, invades sandy habitats. (Geoff Nichols, Durban)

*Canna flaccida* (golden canna)–riverbanks, Amanzimtoti, Port Shepstone (Michael Cheek, ED & RR, Durban)

*Diplocyclos palmatus* (lollipop-climber)–pest in Durban, around Kloof and Hillcrest. Has been around for more than 10 years now and is seen more frequently in the Palmiet, Molweni and Umgeni River systems. It is beyond an emerging weed where it is smothering forest and garden edges. Native to tropical East Africa and Asia. (Geoff Nichols, Durban)

*Euphorbia leucocephala* (white poinsettia)–Durban; spreading slowly; but needs watching. Naturalized in Zimbabwe. (Geoff Nichols, Durban)

*Fallopia sachalinensis* (giant knotweed)–Pietermaritzburg: Dorpspruit. Very common weed up to 3 m high, but usually 2 m. Forming dense clumps. Flowers white. (Mike Wells, herbarium specimen in PRE 1980). There is uncertainty about the identification of a similar-looking plant seen on the N3 highway near Mooi River in March 2005. (Geoff Nichols, Durban)

*Furcraea foetida* (Mauritius hemp)–Durban; disturbed sites. Easily confused with *Agave sisalana* (sisal), but has softer, reflexed leaves. (Michael Cheek, SANBI ED & RR, Durban)

*Hydrocleys nymphoides* (water poppy)–Dam near Cedara agricultural research station. (Michael Cheek, SANBI ED & RR, Durban)

*Ipomoea coccinea* (red morning-glory)–from Durban and Umkomaas. (Steven P. Butler, Westville)

*Ipomoea hederifolia* (ivy-leaf morning-glory)–north coast (Clive Bromilow)

*Liquidambar styraciflua* (sweet or red gum)–Champagne Falls; spreading into grassland. (Cobus Botha DoA, Pietermaritzburg)

*Murraya paniculata* (orange jessamine)—Durban gardens; Berea, Seaview and old line suburbs; frequent escape from cultivation. Native to Australasia. Invasive in Florida, USA; Pacific Islands, and even in Australia outside of its natural range. (Geoff Nichols, Durban)

*Phormium tenax* (New Zealand flax)—pockets of infestations in plantations in Greytown area. (Jacqui Shuttleworth, Mondi).

*Pterocarya stenoptera* (Chinese wing nut)—invading stream in Chase Valley, Pietermaritzburg. (Richard Boon, Durban)

*Roldana pentasitis* (velvet groundsel)—invading gardens and disturbed sites all over Hilton and Winterkloof. Pest plant in New Zealand. Risk areas: low and disturbed forest, forest margins, shady sites. (Jeremy Goodall, ARC-PPRI)

*Ruellia simplex* (Mexican bluebells)—Amanzimtoti, riverbanks (Geoff Nichols, Durban)

*Sagittaria platyphylla* (slender arrowhead)—Krantzkloof, stream. This species is native to North and Central America. It is already a huge problem in some areas of Australia where it has become established. Urgent steps need to be taken to control or eradicate this species. Not on CARA or NEMBA. (Rene Glen, Durban)

*Schefflera arboricola* (dwarf umbrella-tree)—Durban and south coast. (Geoff Nichols, Durban)

*Schefflera elegantissima* (false aralia)—Durban. (Geoff Nichols, Durban)

*Turnera ulmifolia* (yellow-alder)—seeding itself in gardens and has the potential to spread; naturalized in other parts of Africa, Madagascar and Australia (Geoff Nichols, Durban)

*Viola priceana* (confederate violet)—has invaded an indigenous garden in Hilton. Likes damp spots and must have come in by seed (wind dispersed). (Jeremy Goodall, ARC-PPRI)

#### N Cape:

*Brachychiton populneus* (kurrajong)—Military base near Kimberley airport; spreading into savanna near airport. (Dr. Sue Milton)

#### W Cape:

*Acacia adunca* (Wallangarra wattle)—Bien Donn , near Stellenbosch, planted but has spread into natural vegetation. (Fiona Impson, ARC-PPRI)

*Acanthus mollis* (bear's-breech)—Newlands Forest, Constantia, Cape Town, invading watercourses (Terry Hodson, Cape Town)

*Allium triquetrum* (three-angled garlic)—abundant on roadsides, disturbs sites, around habitation in Cape Town area. (Tony Rebelo, CAPE Invasive Alien Species Programme)

*Anigozanthos flavidus* (tall kangaroo paw)—invading a swampy area on the outskirts of Kleinmond and extensively on the farm Honingklip. This species is now under investigation by the ED & RR team. Native to Western Australia (reported by Dr Stefan Naser in Kleinmond in 2008; first record for Honingklip farm in 1998 by Robin Adair, Australia)

*Calothamnus sanguineus* (one-sided bottlebrush)—Silvermine along the old (mostly rehabilitated) north road to the ex summit plantation. It is a resprouter and serotinous, making it a high priority for invader concern. The plant found was 0.5 m tall but had over 200 seed filled cones (veld burned 2000). Seed was removed. The fact that it had a good seed crop suggests that there are probably others in the area. Message sent to Sanparks requesting the plants be removed. (Tony Rebelo, CAPE Invasive Alien Species Programme)

*Castanea sativa* (sweet chestnut)—Newlands Forest, Table Mountain National Park. Casual alien, possibly naturalized. Occurs in native forest and plantations. (Karen Alston & David Richardson, Centre for Invasion Biology, Stellenbosch)

*Cyrtomium falcatum* (Japanese holly fern)—Wilderness to Victoria Bay; alongside railwayline. (Johan Baard, Sanparks)

*Dianella tasmanica* (blue flax-lily)—Newlands Forest, Table Mountain National Park. Casual alien, possibly naturalized. (Karen Alston & David Richardson, Centre for Invasion Biology, Stellenbosch)

*Droguetia* sp.—Newlands Forest, Table Mountain National Park. One of the top ten most abundant species in the survey area. (Karen Alston & David Richardson, Centre for Invasion Biology, Stellenbosch)

*Erigeron* hybrid (fleabane)—Newlands Forest, Table Mountain National Park. Casual alien. (Karen Alston & David Richardson, Centre for Invasion Biology, Stellenbosch)

*Eucalyptus botryoides* (bangalay)—major invader at Tokai. Prefers wetter sites. (Tony Rebelo, CAPE Invasive Alien Species Programme)

*Euphorbia lathyris*—George area; recent garden fence jumper, spreading along roadsides, drainage ditches, watercourses. (Kasey Voges, previously WfW)

*Gaura ?lindheimeri* (butterfly flower)—spreading along roadsides and invading vacant plots in the Kleinmond area. This perennial herb, native to N America, is a popular garden ornamental. (Dr. Stefan Naser, previously of ARC-PPRI)

*Impatiens sodenii* (impatiens)—De Hel, Constantia, Cape Peninsula; invades watercourses; indigenous to East Africa. (Terry Hodson, Cape town)

*Kunzea ericoides*(= *Leptospermum ericoides*) (burgan, kanuka or white tea tree), family Myrtaceae, was detected as an emerging invader in a single river catchment in the George area. Burgan is a shrub or small tree, native to south-eastern Australia and New Zealand where it grows in a wide range of habitats. It easily invades any habitat containing open forest complexes and proceeds to out-compete other young trees and shrubs, shading out groundlayer plants. Kasey Voges has proposed that this species be prioritized for eradication and should be listed as a category 1a under the revised CARA regulations. (Kasey Voges, consultant, previously employed by WfW)

*Melaleuca ericifolia* (swamp paperbark)—invading rehabilitated and rehydrated wetland at the Kluitjieskraal Forestry Plantation, near Wolsely. This species is not only a threat to the wetland but could also invade the Breede River. Investigation and control by ED & RR, Cape Town. (First reported by Japie Buckle, previously with WfW, in January 2008).

*Melaleuca quinquenervia* (broad-leaf paperbark)

– on a mountain slope (fynbos), but the population seems confined to a seep. Waterval Nature Reserve near Kluitjieskraal, Tulbagh/Wolseley District (Ernita van Wyk, ED & RR, Cape Town)

- Cape Peninsula at Tokai where seedling regeneration has been reported (Tony Rebelo, CAPE Invasive Alien Species Programme). This species has invaded the everglades in Florida, USA, and is potentially very invasive.

*Microsorium scandens* (climbing Australian fern)—stream within Kirstenbosch Botanical Garden. (Dr John Rourke, SANBI)

*Papaver rhoeas* (field poppy)—Cape Town. (Tony Rebelo, CAPE Invasive Alien Species Programme)

*Pittosporum crassifolium* (stiff-leaf cheesewood)—is not spreading but there is seedling regeneration at 'The Craggs' near Plettenberg Bay. This species has been proposed as a category 3 plant under CARA and NEMBA. (Kasey Voges, George)

*Platanus xacerifolia* (London plane)–in the Hex River near De Doorns. (Kasey Voges)

*Pteris tremula* (Australian bracken)–invading Newlands Forests.(Dr John Rourke, SANBI)

*Ravenala madagascariensis* (traveller's palm)–invasive in Plettenberg Bay area. (Kasey Voges, George)

*Sisyrinchium graminoides* –Cape Town area. Plants are growing in wet soil. Identification by DR. John Manning of Kirstenbosch, who states that this species appears to be spreading through the country. Thus far it seems to be largely restricted to lawns but the plants should be destroyed. (Tony Rebelo, CAPE Invasive Alien Species Programme)

*Sisyrinchium micranthum* (minute blue-eyed grass)–Cape Town area. This is an annual plant belonging to the family Iridaceae. There is suspicion that it is being spread by gardening services as it occurs in lawns and on road verges. It has been recorded from Bergvliet, Oakridge, Kirstenbosch, Boschendal and Sandvlei. According to Dr John Manning, Iridaceae expert at Kirstenbosch, this species could, perhaps, fill a vacant niche as there are no annual Iridaceae in the Cape or it could occupy the same niche as annual grasses. (Tony Rebelo, CAPE Invasive Alien Species Programme)

*Solanum aviculare* (kangaroo-apple)–George area; disturbed sites, edges of wetland and watercourses; bird-dispersed. Ornamental. (Kasey Voges, Previously WfW)

*Telopea speciosissima* (waratah)–Helderberg Nature Reserve; 3 small populations. Possibly not more than 100 plants. (Ernita Van Wyk, ED & RR, Cape Town)

#### E Cape:

*Myrtillocactus geometrizans* (bilberry cactus)–Addo Elephant National Park; featured in SAPIA News no. 10. The plants were found in natural veld and not near any habitation or plantings. This cactus has a columnar tree-like growth form, reaching heights of 4 m. It produces edible dark purple berries about 20 mm across and is likely to be dispersed by birds and monkeys. (Nollie Bosman, Sanparks)

#### Karoo:

*Cylindropuntia fulgida* var. *mamillata* (boxing-glove cactus)–Karoo, Northern Cape and Limpopo. This is the 'crested' variety with wavy stem cladodes. (Dr. Helmuth Zimmermann, previously ARC-PPRI)

*Phyla canescens* (daisy lawn)–Gariiep Dam on the Orange River, where it stretches for about 200 km along the southern shores and dominates the dam fluctuation zone. (Dr. Sue Milton)

#### Zimbabwe and Mozambique:

*Hyptis suaveolens* (horehound)–seems to colonize most of the road verges north of the Zambezi River although it does occur as far south as the Beira area. It is very common in northern Mozambique. It is multistemmed, herbaceous, but can reach up to 3 m tall. Found in several African countries, from Ghana and Tanzania moving southwards. Weed elsewhere e.g Australia. (Mervyn Lötter, Mpumalanga Tourism & Parks)

*Vernonia* cf. *polyantha* –Vumba Mountains, eastern Zimbabwe; also in Mozambique. Provisionally identified from photographs by Paul Herman at Pretoria National Herbarium. Apparently widespread in Mozambique where it may have been cultivated as a good bee plant. Grows on forest edges and disturbed ground where forest has been cleared. A large shrub up to 4 - 5 m tall, with white flowers. (Mark Hyde, Harare)

#### **Update of records in the SAPIA database**

A total of 13 470 records have been added to the SAPIA database during the five year contract; 12 407 from roadside surveys done by L. Henderson and 1063 records from 93



members of the public. Only 24 public records were submitted at the WIP website; the rest were received directly by L. Henderson, mainly by e-mail.

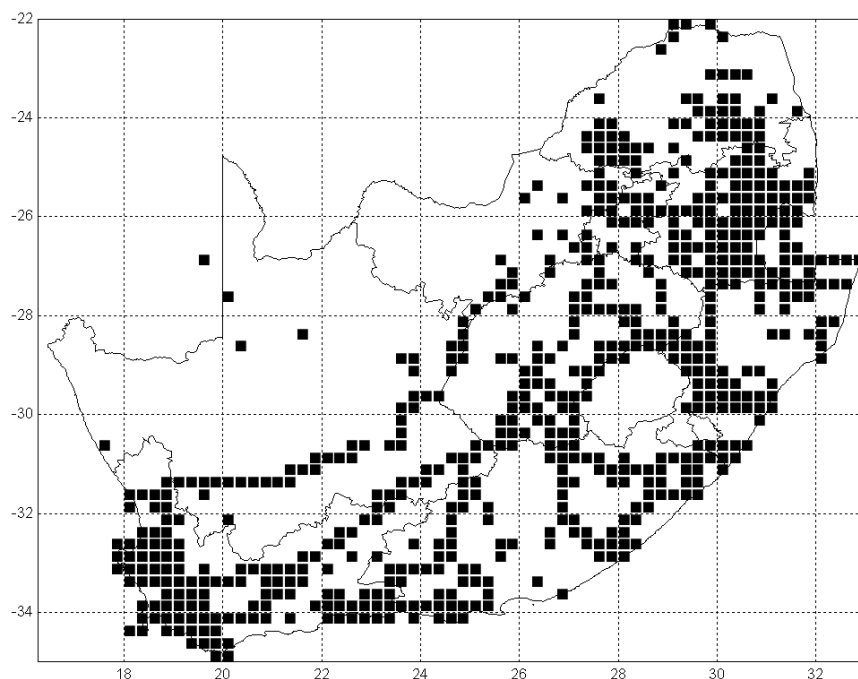


Figure 3. ¼ degree square coverage of SAPIA records from roadside surveys and contributions from the public, April 2005 to February 2010.

## 2. NOTABLE ACHIEVEMENTS

The Weeds and Invasive Plants (WIP) website [www.agis.agric.za/wip/](http://www.agis.agric.za/wip/) is the most frequently visited website on AGIS.

## 3. PROBLEMS AND CONSTRAINTS

AGIS was slow in meeting the deadlines set out in 'Deliverables'. It appears that the initial 'wish list' for improving the functionality and making all the data available to the public was very ambitious—it can be done but it will take time, more capacity and more funding to accomplish.

The problem concerning the online editing of species information in the virtual herbarium has been ongoing for 22 months from May 2008 to March 2010. No editing can be done online from SANBI where the Project Manager (L Henderson) is situated. The problem lies with the firewall of DoA. The problem not only prevents the editing of existing data but adding new species and images. The batch uploading of data can't be done until new species names have been added to the herbarium.

Further problems with the development of the WIP website have arisen from the slow (or no) response to requests for changes (RFC requests) by the developer (Carin Pretorius) to AGIS management in DoA.

The success of the SAPIA II project is dependent on public participation and especially dedicated field observers. WfW field staff should form an integral part of the project but no progress has been made in this direction. However, SANBI's Early Detection and Rapid Response of Invasive Alien Plants project should substantially complement the SAPIA II project.

#### 4. ADDITIONAL RESEARCH NEEDS

Dedicated field observers are needed for the SAPIA II project. This has been covered under the previous point.

#### 10. FINANCIAL REPORT

Item		2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Human Resources	Budget allocated	318 744	450 456	338 024	340 000	260 000
	Budget used	147 237	434 456	321 024	340 000	260 000
Subsistence and travel	Budget allocated	23 400	41 800	36 800	42 000	39 000
	Budget used	12 787	22 137	27 639	42 000	30 000
Running expenses	Budget allocated	10 000	10 000	10 000	10 000	8 000
	Budget used	5 000	8 000	6 750	10 000	8 000
Equipment	Budget allocated	15 000	15 000	7 000	0 0000	0 000
	Budget used	0 000	6 450	0 000	0 0000	0 000
Total	Budget allocated	368 000	517 256	391 824	392 000	307 000
	Budget used	165 024	471 043	357 913	392 000	298 000

Allocated budget:

R368 000 for the 2005/2006 financial year;

R392 008 per year for 2006/2007 – 2009/2010

#### Note

1. In 2009/2010 the ARC cut running expenses of all contracts and a saving was made of R80 000 under Human Resources (the allocation of R100 000 to ARC-ISCW for integration within AGIS was cut to R20 000. This was justified because of lack of performance).
2. The allocated budget did not take into account inflationary increases in costs of the project.

#### 11. PUBLICATIONS

1. Henderson, L. 2006. Comparisons of invasive plants in southern Africa originating from southern temperate, northern temperate and tropical regions. *Bothalia* 36:201–222.
2. Henderson, L. 2007. Invasive, naturalized and casual alien plants in southern Africa: a summary based on the Southern African Plant Invaders Atlas (SAPIA). *Bothalia*.37,2: 215–248.
3. Richardson, D.M., Henderson, L. & Ivey, P. 2006. Taking control of biological invasions. In C.K. Willis (ed.), *Conserving South Africa's plants: a South African response to the Global Strategy for Plant Conservation*. SANBI Biodiversity Series 1: 42–46.

4. Wilson, J.R.U., Richardson, D.M., Rouget, M., Procheş, Ş., Amis, M.A., Henderson, L. & Thuiller, W. 2007. Residence time and potential range: crucial considerations in modelling plant invasions. *Diversity and Distributions* 13: 11–22.

## 12. GENERAL

- Attended the Biological Control of Weeds Workshops in 2005, 2006, 2007 and 2008 and gave progress reports on the SAPIA II project. Permission to attend the workshop in May 2009 was declined by ARC-PPRI due to financial constraints.
- Attended the 10<sup>th</sup> Ecology and Management of Alien Plant Invasions (EMAPI) Congress held from 23rd–27th August 2009 at Spier Wine Estate, outside Stellenbosch in the Western Cape and presented an oral paper ‘SAPIA and range expansion of some invasive species in South Africa’. All expenses were covered separately by the Working for Water programme.
- Assisted with the production of a poster on invasive alien plants in Gauteng, titled ‘The Dirty Dozen’, featuring lantana, bugweed, queen of the night, pompom weed, yellow bells, Chilean cestrum, water hyacinth, cat’s claw creeper, black, silver and green wattles, grey and white poplars, seringa and privets. The poster was produced by the Gauteng Department of Agriculture, Conservation and Environment in September 2007.
- Attended and gave a lecture at a public meeting dealing with pompom weed control in the Barberton area of Mpumalanga on Thursday 9<sup>th</sup> October 2008. Invited persons were local farmers, Government stakeholders and WfW.
- Attended a workshop hosted by SANBI in Durban on 18<sup>th</sup> March 2009: Identifying and setting priorities for emerging invasive alien plants in KwaZulu-Natal. Provided information from the SAPIA database and a ranking of species for discussion. A similar ranking of species was compiled for the Western Cape.
- Provided supporting information on IAPs for the legislation being drafted and under review for NEMBA and CARA.
- Provided comments and photos for various WfW posters on IAPs and pamphlets compiled by the WfW-nurseries partnership.

## 13. DATA

All the SAPIA data up to October 2007 has been incorporated into AGIS (jointly managed by ARC-ISCW and National Department of Agriculture (DoA)). All the data up to March 2010 is held in the SAPIA MS Access database on L. Henderson’s PC and with a backup copy on the SANBI server.

## APPENDIX

Table 1. Species added to the SAPIA database from April 2005 to March 2010

Scientific Name:	Common Name	Year 1 <sup>st</sup> recorded in SAPIA  * not newly emerging	Province	SAPIA surveys, ED & RR, CAPE IAS programme or other
<i>Acacia adunca</i> A. Cunn. ex G. Don	Wallangarra wattle	2007	W Cape	
<i>Acanthus mollis</i> L.	bear's-breech	2005	W Cape	
<i>Achillea millefolium</i> L.	yarrow	2009 *	KZN	ED & RR
<i>Actinidia deliciosa</i> (A.Chev.) C.F.Liang & A.R.Ferguson	Kiwifruit	2009	KZN	
<i>Agrimonia procera</i> Wallr.	scented agrimony	2008 *	Limp, Mpum, KZN	SAPIA
<i>Allium triquetrum</i> L.	three-cornered garlic	2008	W Cape	CAPE IASP
<i>Ambrosia psilostachya</i> DC.	perennial ragweed	2008 *	KZN	ED & RR
<i>Amsinckia menziesii</i> (Lehm.) A.Nelson & J.F.Macbr.	fiddleneck	2007 *	W Cape	SAPIA
<i>Anagallis arvensis</i> L.	scarlet pimpernel	2005 *	W Cape	
<i>Aralia spinosa</i> L.	devil's walking stick	2008	KZN	
<i>Araucaria bidwillii</i> Hook.	bunya-bunya	2005	E Cape	SAPIA
<i>Ardisia elliptica</i> Thunb.	shoebuttan ardisia	2005	KZN	
<i>Argemone albiflora</i> Hornem. subsp. <i>texana</i> G.B. Ownbey	white prickly poppy	2007	W Cape	SAPIA
<i>Bauhinia forficata</i> Link	thorny orchid tree	2007	Mpum	SAPIA
<i>Berberis</i> cf. <i>chitria</i> Ker Gawl.	berberis	2007	Limp	
<i>Brachychiton populneus</i> (Schott & Endl.) R.Br.	kurrajong	2006	N Cape	
<i>Callisia repens</i> (Jacq.) L.	creeping inch plant	2006	KZN	
<i>Calothamnus sanguineus</i> Labill.	one-sided bottlebrush	2006	W Cape	CAPE IASP
<i>Canna flaccida</i> Salisb.	golden canna	2009	KZN	ED & RR
<i>Castanea sativa</i> Mill.	sweet chestnut	2005	W Cape	
<i>Chukrasia tabularis</i> A.Juss.	Indian mahogany	2007	Limp	SAPIA
<i>Coprosma repens</i> A.Rich.	mirrorplant	2009 (2004?)	W Cape	SAPIA
<i>Crataegus</i> cf. <i>mexicana</i>		2008	W Cape	SAPIA
<i>Crocasmia</i> cf. <i>paniculata</i> invasive form of indigenous cultivar	red-flowered crocasmia	2007	Limp, Mpu, KZN	SAPIA
<i>Cuphea micropetala</i> Kunth	tartan bush	2006	Limp	SAPIA
<i>Cyathea cooperi</i> (Hook. Ex F. Muell.) Domin	Australian tree fern	2005	W Cape, KZN	SAPIA
<i>Cylindropuntia fulgida</i> (Engelm.) F.M.Knuth var. <i>mamillata</i>	boxing-glove cactus	2008	N Cape, W Cape, Limp	
<i>Cylindropuntia tunicata</i> (Lehm.) F.M. Knuth [needs confirmation]	sheathed cholla	2008	E Cape	SAPIA
<i>Cyrtomium falcatum</i> (L.f.) C.Presl	Japanese holly fern	2008	W Cape	
<i>Dianella tasmanica</i> Hook. f.	blue flax-lily	2005	W Cape	
<i>Diplocyclos palmatus</i> (L.) C.Jeffrey	lollipop-climber	2007	KZN	
<i>Droguetia</i> sp.		2005	W Cape	
<i>Echinopsis chamaecereus</i> F.Friedrich &	peanut cactus	2009	Gaut	

W.Glaetzel				
<i>Echium candicans</i> L.f.	pride-of-Madeira	2008	W Cape	
<i>Erigeron hybrid</i>	fleabane	2005	W Cape	
<i>Eschscholzia californica</i> Cham.	Californian poppy	2009	KZN	
<i>Eucalyptus botryoides</i> Sm.	bangalay	2009	W Cape	CAPE IASP
<i>Euphorbia esula</i> L.	leafy spurge	2006	Gaut	
<i>Euphorbia lathyris</i> L.	caper spurge	2006	W Cape	
<i>Euphorbia leucocephala</i> Lotsy	white poinsettia	2005	KZN	
<i>Fallopia sachalinensis</i> (F. Schmidt) Ronse Decr.	giant knotweed	2005 (PRE1980)	KZN	
<i>Fraxinus pennsylvanica/velutina</i>	green ash/velvet ash	2007	F Stat	SAPIA
<i>Furcraea foetida</i> (L.) Haw.	Mauritius hemp	2009 *	KZN	ED & RR
<i>Gaura lindheimeri</i> Engelm. & A.Gray	butterfly flower	2008	W Cape	
<i>Gunnera</i> sp. giant	giant gunnera	2007	Limp	SAPIA
<i>Harrisia balansae</i> (K.Schum.) N.P.Taylor & Zappi		2009	NW Prov	
<i>Heimia salicifolia</i> Link	willow-leaf heimia	2007	NW Prov	
<i>Hydrangea</i> sp.	hydrangea	2007	Limp	SAPIA
<i>Hydrilla verticillata</i> (L.f.) Royle	hydrilla	2006 *	KZN	SAPIA
<i>Hydrocleys nymphoides</i> (Humb. & Bonpl. ex Willd.) Buchenau	water poppy	2009	KZN	ED & RR
<i>Hyptis suaveolens</i> (L.) Poit.	horehound	2009 (Mozambique)		
<i>Impatiens sodenii</i> Engl. & Warb.	impatiens	2006	W Cape	
<i>Ipomoea cairica</i> (L.) Sweet var. <i>cairica</i> [indigenous]		2009	W Cape	SAPIA
<i>Ipomoea coccinea</i> L.	red morning-glory	2008	KZN	
<i>Ipomoea hederifolia</i> L.	Ivy-leaf morning-glory	2009	KZN	
<i>Kunzea</i> cf. <i>ericoides</i> (A.Rich.) Joy Thomps.	burgan	2007	W Cape	
<i>Lespedeza cuneata</i> (Dum.Cours.) G.Don	bush clover	2009 *	KZN	ED & RR
<i>Linaria vulgaris</i> Mill.	yellow toadflax	2006 *	Gaut	
<i>Liquidambar styraciflua</i> L.	sweet gum	2007	KZN	
<i>Lupinus angustifolius</i> L.	blue lupine	2007 *	W Cape	SAPIA
<i>Lupinus luteus</i> L.	yellow lupine	2007 *	W Cape	SAPIA
<i>Malva verticillata</i> L.	Chinese mallow	2009 *	W Cape	SAPIA
<i>Maranta leuconeura</i> E.Morren	prayerplant	2009	KZN	ED & RR
<i>Melaleuca ericifolia</i> Sm.	swamp paperbark	2008	W Cape	ED & RR
<i>Melaleuca nesophila</i> F.Muell.	mindiyed	2009	W Cape	SAPIA
<i>Melaleuca quinquenervia</i> (Cav.) S.T.Blake	broadleaf teatree	2008	W Cape	CAPE IASP
<i>Microsorium scandens</i> (G.Forst.) Tindale	climbing Australian fern	2007	W Cape	
<i>Murraya paniculata</i> (L.) Jack	orange jessamine	2005	KZN	
<i>Myoporum insulare</i> R.Br.	manatoka	2007	W Cape	SAPIA
<i>Myrtillocactus geometrizans</i> (Mart.) Console	bilberry cactus	2008	E Cape	
<i>Nephrolepis cordifolia</i> (L.) C.Presl	erect sword fern	2006 *?	Limp, Mpum, E Cape, W Cape	SAPIA

<i>Nierembergia linariifolia</i> Graham var. <i>glabriuscula</i> (Dunal) Cocucci & H	nierembergia	2005 *(PRE 1925)	Gaut, F Stat, NW Prov, E Cape, W Cape	
<i>Opuntia elata</i> Link & Otto ex Salm-Dyck var. <i>elata</i>	orange tuna	2009	W Cape	SAPIA
<i>Papaver rhoeas</i> L.	corn poppy	2008	W Cape	CAPE IASP
<i>Paspalum distichum</i> L.	common paspalum	2009 *?	KZN	ED & RR
<i>Persicaria capitata</i> (Buch.-Ham. ex D.Don)	knotweed	2007	Limp, Mpum, KZN, W Cape	SAPIA
<i>Phyla canescens</i> (Kunth) Greene	daisy lawn	2008	E Cape	
<i>Phytolacca americana</i> L.	American pokeweed	2007 *	Limp, F Stat, W Cape	SAPIA
<i>Pittosporum crassifolium</i> Banks & Sol. ex A.Cunn.	stiff-leaf cheesewood	2008	W Cape	
<i>Pteris tremula</i> R.Br.	Australian bracken	2007	W Cape	
<i>Pyrostegia venusta</i> (Ker Gawl.) Miers	golden shower	2006	Limp	SAPIA
<i>Quisqualis indica</i> L.	Rangoon creeper	2006	KZN	SAPIA
<i>Ranunculus</i> cf. <i>rionii</i> Lagger	water crowfoot	2008 *?	E Cape	SAPIA
<i>Rapistrum rugosum</i> (L.) All.	wild mustard	2007 *	W Cape	SAPIA
<i>Ravenala madagascariensis</i> Sonn.	traveller's-palm	2007	W Cape	
<i>Roldana petasitis</i> (Sims) H.Rob. & Brettell	velvet groundsel	2009	KZN	
<i>Ruellia simplex</i> C. Wright	Mexican-bluebells	2009	KZN	
<i>Sagittaria platyphylla</i> (Engelm.) J.G.Sm.	slender arrowhead	2010 (2004?)	KZN, E Cape	
<i>Salvia</i> cf. <i>coccinea</i> Buc'hoz ex Etl.	scarlet sage	2009	NW Prov	
<i>Salvia tiliifolia</i> Vahl	Lindenleaf sage	2005 *	Gaut, Mpum, KZN	SAPIA
<i>Salvia verbenaca</i> L.	wild sage	2007 *	W Cape	SAPIA
<i>Schefflera arboricola</i> (Hayata) Merr.	dwarf umbrella-tree	2005	KZN	
<i>Schefflera elegantissima</i> (hort. Veitch ex Mast.) Lowry & Frodin	false aralia	2005	KZN	
<i>Sisyrinchium graminoides</i>	iris	2009	W Cape	CAPE IASP
<i>Sisyrinchium micranthum</i> Cav.	minute blue-eyed grass	2009	W Cape	CAPE IASP
<i>Solanum aculeatissimum</i> Jacq.	apple of Sodom	2007 *?	Limp	SAPIA
<i>Solanum aviculare</i> G.Forst.	kangaroo-apple	2006	W Cape	
<i>Solanum viarum</i> Dunal	tropical soda apple	2006	KZN	SAPIA
<i>Sonchus asper</i> (L.) Hill	spiny sowthistle	2005 *	W Cape	
<i>Telopea speciosissima</i> (Sm.) R.Br.	waratah	2009	W Cape	ED & RR
<i>Tibouchina</i> cf. <i>elegans</i>	tibouchina	2009	Limp, KZN, E Cape	SAPIA
<i>Tradescantia zebrina</i> hort. ex Bosse	wandering jew	2005	KZN, E Cape	SAPIA
<i>Turnera ulmifolia</i> L.	yellow-alder	2009	KZN	
<i>Verbena litoralis</i> Kunth	seashore vervain	2009 *	W Cape	SAPIA
<i>Vernonia</i> cf. <i>polyantha</i>		2009 (ZIMBABWE)		
<i>Viola priceana</i> Pollard	confederate violet	2005	KZN	



# SAPIA NEWS

SOUTHERN AFRICAN PLANT INVADERS ATLAS

January 2010

ARC-Plant Protection Research Institute

No. 14



## 2010 is here!

Yes, we all know that 2010 marks the soccer world cup but did you know that it is the International Year of Biodiversity? The soccer world cup will come and go; some will benefit; many will not—but biodiversity benefits us all and is essential for our existence—today and in the future.

The International Year of Biodiversity (IYB) was declared by the United Nations General Assembly. This global public communication initiative will be driven by the Convention for Biological Diversity (CBD). See page 2 for more information.

### Inside this issue:

2010 International Year of Biodiversity	1 & 2
Pompom weed in KZN Drakensberg	1
Invasive alien plants at foothills of KZN Drakensberg	3 & 4
Emerging ornamental weeds Goldencup St. Johnswort Japanese honeysuckle Ash-leaved maple	5

**We depend on biodiversity for everything we need and value from the Earth.**  
Biodiversity loss is driven by habitat destruction, unsustainable harvesting, invasive species, climate change and pollution. (Dr Bob Scholes, CSIR)



This issue of SAPIA News focuses on invasive alien species at the foothills of the Drakensberg Mountains in KwaZulu-Natal. The uKhahlamba / Drakensberg Park was listed by UNESCO in 2000 as a World Heritage Site. The park is also in the List of Wetlands of International Importance (under the Ramsar Convention). The park is rich in biodiversity. Threats include invasive alien species and overgrazing.

All the SAPIA Newsletters are posted at WIP and can be downloaded free of charge

You are invited to participate in the SAPIA phase II project.

Submit records online at:  
Weeds and Invasive Plants website  
[www.agis.agric.za/wip](http://www.agis.agric.za/wip)

Editor and SAPIA coordinator:  
Lesley Henderson  
ARC-PPRI, Weeds Division  
c/o SANBI  
Private Bag X101  
Pretoria  
0001  
South Africa

e-mail: [L.Henderson@sanbi.org.za](mailto:L.Henderson@sanbi.org.za)  
Tel: 012 843 5035  
Fax: 012 804 3211  
website:  
[www.agis.agric.za/wip](http://www.agis.agric.za/wip)

Photos by Lesley Henderson unless otherwise acknowledged

## Pompom weed in KZN Drakensberg

Pompom weed was recorded for the first time in January 2010 in the Champagne Valley at the foothills of the Drakensberg Mountains in KwaZulu-Natal. The plants were seen on the road verge and since they were so far from any other known pompom site they were probably escapes from cultivation. Pompom weed is a serious threat to the conservation of grasslands and is a prohibited plant. For more information on pompom weed see the ARC website ([www.arc.agric.za](http://www.arc.agric.za))

