

July 2018

No. 49



environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

### Inside this issue:

**Invasive water lilies  
in South Africa  
and look-alikes** 1, 2–3

**South Africa's grasslands  
under threat by the  
densification of  
an indigenous species:  
Bankrupt Bush  
(*Seriphium plumosum*)** 1, 4–6

Plant Protection Research



## SOUTHERN AFRICAN PLANT INVADERS ATLAS

Newsletter of the Southern African Plant Invaders Atlas, an initiative of the Weeds Research Division of Plant Protection Research, an institute within the Agricultural Research Council (ARC)

## Invasive water lilies in South Africa



Photo: Louise Stafford

Photo: Julie Coetzee

Invasive yellow water lilies (*Nymphaea mexicana* and hybrids) have invaded rivers, lakes and dams in South Africa. Dense infestations can increase siltation, block waterways and hamper recreational activities. Thick mats provide breeding grounds for mosquitoes and disrupt the aquatic environment by reducing light penetration. Rotting material increases nutrients and reduces oxygen in the water which can be fatal to fish. The degradation of waterbodies reduces the biodiversity of the ecosystem.

**Editor and SAPIA co-ordinator:**  
Lesley Henderson  
ARC-PPRI  
Weeds Research Division  
stationed at 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

Articles and photos by Lesley Henderson  
unless otherwise acknowledged

SAPIA newsletters are posted at  
ARC website: [www.arc.agric.za](http://www.arc.agric.za) and  
Invasive Species Website:  
[invasives.co.za](http://invasives.co.za)

## Bankrupt bush

Bankrupt bush (*Seriphium plumosum*) is an unpalatable, indigenous dwarf woody shrub that has encroached into large parts of mesic grasslands and some savanna areas of South Africa.

It competes with and replaces natural grazing lands at an enormous rate and scale. It has been estimated that 10 million hectares of rangeland could be lost for agricultural production.

Farmers spend millions of rands each year on fruitless efforts to eradicate this plant.

See page 6 for a proposed management strategy for this species.



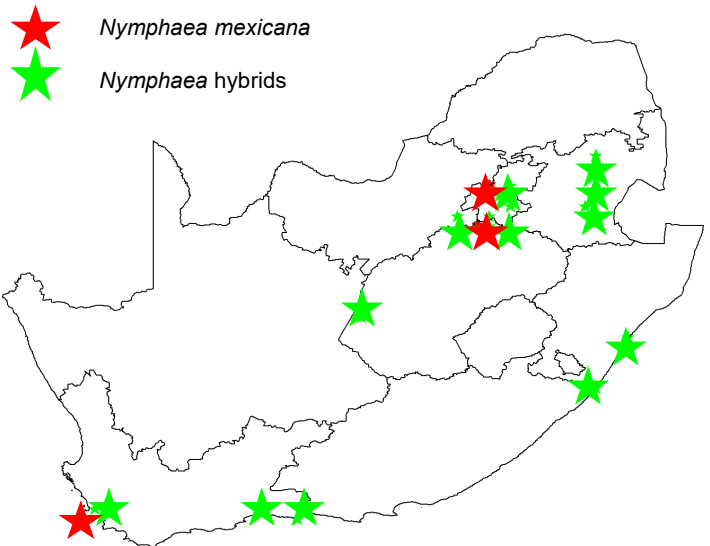


## Invasive water lilies in South Africa

Yellow water lilies (*Nymphaea mexicana* and hybrids) (**photo 1**) are the most invasive of the introduced water lilies in South Africa. Plants with white and pink flowers have also been noted as garden escapes.

Invasive water lilies can form spreading colonies along riverbanks and other water bodies to a depth of about 3 m. Unlike the indigenous *Nymphaea* species, they are not adversely affected by the cold highveld winters where they have invaded the Vaal River, lakes and dams.

*N. mexicana* is not easily distinguished from the hybrids but usually has bright yellow flowers with pointed petals as opposed to the hybrids with paler yellow flowers with rounded to pointed petals. Recent DNA sequencing has positively identified *N. mexicana* at Cosmos Lake, Hartbeespoort Dam (Hennie Niemann, University of Johannesburg) and at Westlake and Keyser's Rivers at Zandvlei in Cape Town (Prinavin Naidu, Rhodes University). Yellow water lilies along the Vaal River appear to include *N. mexicana* and hybrids.



*N. mexicana* has bright yellow, pointed petals. Yellow cultivars have paler, rounded to pointed petals.

All water lilies have rhizomes with masses of spongy roots that secure the rhizome. *N. mexicana* can be distinguished from other water lilies by the presence of long, pale stolons that extend horizontally just beneath the surface of the substrate to produce new plants. Once established, plants are difficult to eradicate because unless all rhizomes and stolons are removed the plants will grow again.

Only *Nymphaea mexicana* has been listed in NEM:BA as a category 1b invasive plant, meaning that it may not be cultivated or sold and must be controlled or eradicated where possible. Recent DNA sequencing has shown that hybrid water lilies, especially cv. Cape Canaveral, are more widespread than pure *N. mexicana* and perhaps should also be listed in NEM:BA (personal communication Prinavin Naidu, MSc candidate at the Centre for Biological Control, Rhodes University). Less restrictive legislation could stipulate that the cultivation of all non-indigenous *Nymphaea* hybrids and species be allowed only in small self-contained ponds and other man-made water features that have no hydrological connection to any natural water body.



## Invasive water lilies and look-alikes

Water poppy (*Hydrocleys nymphoides*) (photo 2) and fringed water lily (*Nymphoides peltata*) (photos 3 & 4) are also perennial, rooted, stoloniferous, invasive aquatic plants with yellow flowers and floating leaves. They are emerging invaders, only known from a few localities, and are category 1a listed invaders in NEM:BA, meaning they are top priority for eradication.

Water poppy has thick, shiny, round leaves measuring 5–7 cm across; segmented stems; flowers 3-petaled, about 5 cm across, yellow with reddish brown centres.

Fringed water lily has shiny, round to heart-shaped leaves 3–10 cm across; flowers yellow, 5-petaled, with fringed petal margins; petals are broad and overlapping (photo 5).



Photo: Carina Cilliers



Photo: Lukas Otto



Photos: Hans Grobler



## Indigenous water lilies

There are two indigenous species of *Nymphaea* in South Africa; *N. nouchali* (photos 6a & b), the most widespread species, with flowers opening during the day and usually blue, but also shades of pink, mauve and white; and *N. lotus*, a white-flowered, night-blooming species, occurring in the more tropical regions.

There are no yellow indigenous *Nymphaea* species in South Africa.

The indigenous *Nymphoides thunbergiana* (photo 7), floating heart, has yellow or white flowers, and can be distinguished from the introduced *Nymphoides peltata* by its narrow, non-overlapping petals, and the production of roots at the base of the flower clusters.





## South Africa's grasslands under threat by densification of Bankrupt Bush (*Seriphium plumosum*)

**Ms Dan'sile Cindi** (South African National Biodiversity Institute) & **Ms Mpume Ntlokwana** (Department of Agriculture, Forestry and Fisheries)

### What is bankrupt bush?

Bankrupt bush or *Seriphium plumosum*, belongs to the plant family *Asteraceae*. The name *Seriphium* is derived from *seriph*, a stroke or line of a letter and *plumosum*, meaning feathery. *Seriphium plumosum*, previously known as *Stoebe vulgaris*, is also known as bankrupt bush, slangbos, vaalbos or Khoi-kooigoed. It is indigenous to South Africa, and has naturalised in other countries such as Angola, Namibia, Mozambique and Zimbabwe. *Seriphium* comprises a total of nine species of which five occur in South Africa but *S. plumosum* is regarded as the most aggressive encroacher.

South Africa's grasslands, which provide the cheapest feed for live-stock farmers, are threatened by the encroachment of *Seriphium plumosum*. In the central grassland areas encroachment has already led to the bankruptcy of many stock farmers, hence the common name, the bankrupt bush. Bankrupt bush is said to be highly unpalatable and is very difficult to control once established. The tiny wind dispersed seeds of this plant will spread from single plants or small populations into adjacent areas, irrespective of the condition of such areas. It is difficult to understand the main reasons for the huge spread and densification of this plant, especially over the past five to ten years, but researchers suspect that elevated carbon dioxide levels may have favoured its growing conditions.

### How to identify bankrupt bush

*Seriphium plumosum* is a sprawling, much-branched, grey shrub up to a height of approximately 60 cm (**photo 1**). It has slender, wiry, softly woody branches. Short shoots are covered with greyish, woolly, clustered leaves, which are minute, tufted and pressed to the stem, giving the plant a granular appearance. The small brown to pale purple flowerheads occur at the tips of the shoots (**photo 2**). Plants often have white fluffy galls which might be mistaken for flowers (**photo 3**). The plant has many adaptations to survive long dry summers such as the light colour of the shrub that reflects sun light and the woolly covering and small leaves that reduce water loss. These adaptations are supported by a root system which may vary from 1 m<sup>2</sup> around the plant and up to 1.8 m deep.

### Historical and current occurrences in South Africa

This so-called pioneer plant which slowly, and somewhat unnoticed, colonised significant portions of semi-arid grasslands in South Africa, has become a serious threat to the ecosystems and productivity of grasslands. Bankrupt bush has a widespread geographic occurrence. It is common in areas with mean annual rainfall between 550 to 800 mm per annum.

According to a survey conducted by the Department of Agriculture, Forestry and Fisheries (DAFF) that is continuously updated, bankrupt bush is encroaching in most Provinces of South Africa. Free State Province is the most severely infested, followed by North West, Limpopo, Gauteng, Mpumalanga, KwaZulu-Natal and Eastern Cape Provinces respectively. Although it occurs in fynbos in the Western Cape it is not a threat to grazing.



1



2



3



## Bankrupt Bush (*Seriphium plumosum*)

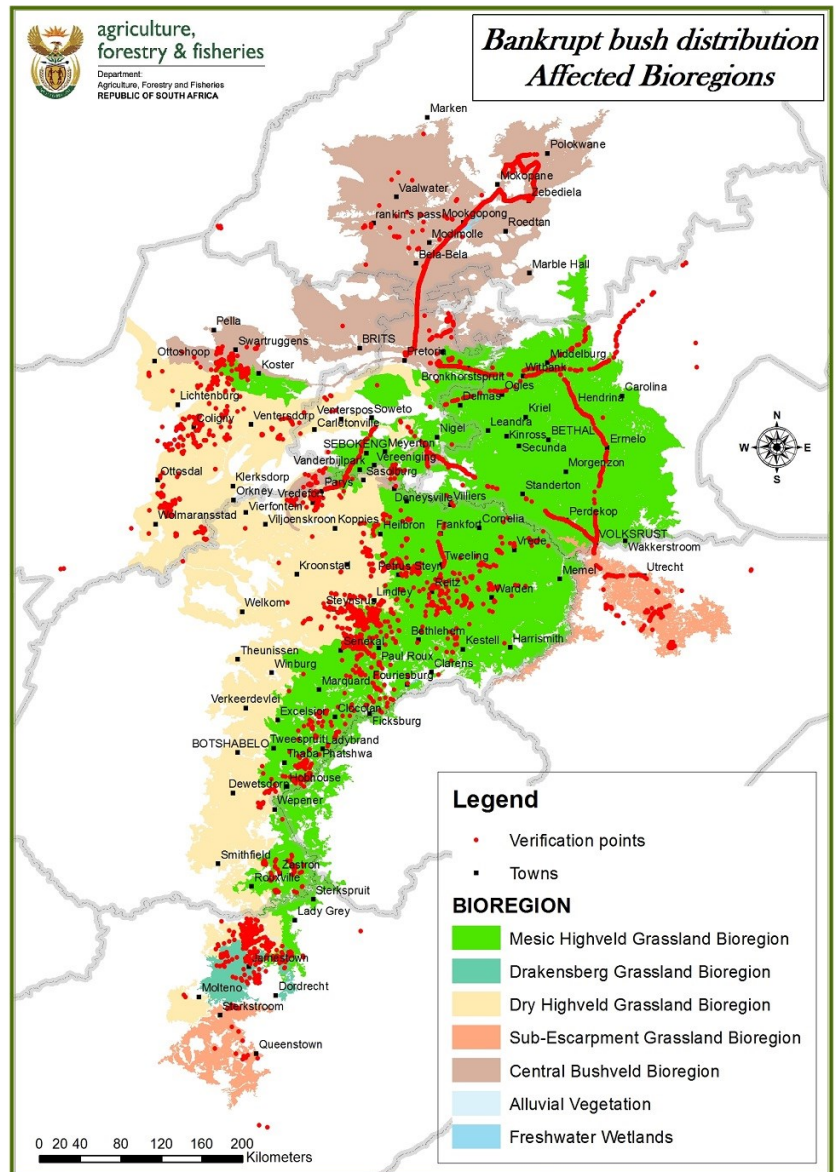
### Why should South Africa be terrified?

In terms of Regulation 16 of the Conservation of Agricultural Resources Act, Act 43 of 1983 (CARA), bankrupt bush is listed as an indicator of bush encroachment in North West Province and Free State. At the time of promulgation of the Act in 1983, bankrupt bush was regarded as a problem in the grassland biome of these two provinces and affected the grazing potential. Although it occurred in other provinces it was not considered a major problem. Since 1983 the problem of bankrupt bush has increased due to its densification in most provinces as highlighted in the distribution map (compiled by Paul Avenant in 2018).

South Africa's natural resources and biodiversity are under severe threat of degradation due to infestation of bankrupt bush. South Africa has a total surface area of 122 million hectares (ha) of which 71% consists of veld which is mostly used for livestock and game ranching. Currently, it is estimated about 10 million ha in South Africa have been infested by bankrupt bush which endangers sustainable grassland production, animal production, food security and biodiversity.

Bankrupt bush densification reduces the carrying capacity of the veld to an extent approximately proportional to its abundance through the mechanism of out-competing preferential plants, i.e. grasses, for available resources such as light, nutrients and water.

Bankrupt bush encroachment can turn a profitable fodder source into a degraded piece of land on which sustainable livestock production is no longer possible.



## Bankrupt Bush (*Seriphium plumosum*)

### Recommended control methods

Various control methods are available for bankrupt bush and recommended depending on a number of factors for example, plant density, cost effectiveness and timelines. Chemical control is the most effective recommended method, while burning and manual clearing of the shrub lead to higher densities if not properly managed. Manual clearing and chemical control however, can become economically unfeasible. All these control measures are probably temporary, with re-invasion inevitable. Aftercare needs to focus on the control of seedlings.

### Bankrupt bush management strategy for South Africa

The Department of Agriculture, Forestry and Fisheries (DAFF) in collaboration with partners from the three spheres of government, including universities such as UNISA, SANBI, Organized Agriculture (AgriSA, TLU SA & AFASA) and NGOs are currently working on the development of a management strategy for bankrupt bush in South Africa. This strategy is envisaged to improve veld productivity, biodiversity, and food security. This strategy will soon be undergoing public consultation and participation in different provinces and there is an open invitation to interested and affected individuals and organizations.

| Events  | Venue  | Time              | Date  |
|---|--|-------------------|-------|
| 1 <sup>st</sup> Provincial Public Consultation Workshop for Gauteng, Mpumalanga, Limpopo & North West | SANBI Education Centre, Pretoria Botanical Gardens | 04 September 2018 | 09:00 |
| 2 <sup>nd</sup> Provincial Public Consultation Workshop for Free State, KwaZulu-Natal & Eastern Cape  | Glen College, Bloemfontein                         | 06 September 2018 | 09:00 |
| National Public Consultation Workshop   | SANBI Education Centre, Pretoria                   | 21 September 2018 | 09:00 |

For more information, contact the office of the Director: Land Use and Soil Management, Ms Lydia Bosoga on Tel No.: 012 319 7686  
Alternatively contact:

Ms Mpume Ntlokwa ; Tel No.: 012 319 7567; Email: [MpumeN@daff.gov.za](mailto:MpumeN@daff.gov.za)

Or Mr Lekgau Mahlatji; Tel No.: 051 409 2617/4; Email: [LekgauMah@daff.gov.za](mailto:LekgauMah@daff.gov.za)

### Literature consulted

- Avenant, P. 2015. Report on the National Bankrupt bush survey (2010-2015). Department of Agriculture, Forestry and Fisheries, Pretoria.
- Avenant, P. & Riggs, I. 2016. Best Practice Manual for the control and management of Bankrupt bush (*Seriphium plumosum*). Department of Agriculture, Forestry and Fisheries, Pretoria.
- Jordaan, F. & Jordaan, D. 2013. Bankrupt bush -Thief of grazing land in the Northwest Province. Department of Rural, Environment and Agricultural Development, Printing Things, Potchefstroom.
- Snyman, H.A. 2009. Germination potential of *Seriphium plumosum* (Bankrupt bush or Vaalbos). Grassroots, Newsletter of the Grassland Society of Southern Africa. (9)1

### Acknowledgements go to the following people for contributions to this article:

Mr Paul Avenant, Mr Ivan Riggs, Ms Mpume Ntlokwa, Mr Lekgau Mahlatji, Mr Melvin Charlie, Ms Susanna Graham, Dieter Jordaan, Dr Erika Van Zyl & Dr Franci Jordaan.



## ARC-PPRI, WEEDS RESEARCH DIVISION



### Plant Protection Research

The Weeds Research Division of the ARC-Plant Protection Research (PPR) is responsible for research on the ecology and control of invasive alien plants in South Africa.

Research Team Manager: Dr Roger Price, e-mail: [PriceR@arc.agric.za](mailto:PriceR@arc.agric.za)