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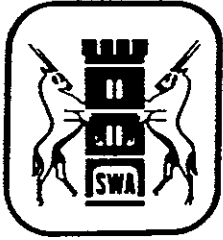
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Invasive alien organisms in South West Africa/Namibia

Edited by C J Brown, I A W Macdonald and S E Brown

This report results from a workshop organized by the Directorate of Nature Conservation and Recreation Resorts in Windhoek, and is produced in conjunction with the Council for Scientific and Industrial Research

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CHAPTER 1 INVASIVE ALIEN PLANTS IN THE COMMERCIAL GRAZING AREAS, URBAN AREAS, DIAMOND AREAS AND HEREROLAND

M A N Muller

INTRODUCTION

This chapter covers a vast area of SWA/Namibia (Map 3). For this reason it has not been possible to record all infestations of all alien plant species, instead the most important infestations of the most important invasive species have been located and recorded, and all known infestations are mentioned. These records are not exhaustive, and minor infestations of invasive alien plants certainly occur in areas other than those mentioned.

The most important invasive alien plants recorded in these areas are Argemone ochroleuca, Chenopodium ambrosioides, Datura ferox, Datura stramonium, Dodonaea viscosa, Flaveria bidentis, Lantana camara, Melia azedarach, Nicotiana glauca, Opuntia aurantiaca, Opuntia engelmannii, Opuntia ficus-indica, Opuntia stricta, Pennisetum setaceum, Prosopis spp, Sesbania punicea, Tagetes minuta and Xanthium spinosum.

SPECIES ACCOUNTS

Argemone ochroleuca (Map 4). The time and means of introduction of this species are unknown. It is currently widespread over most of the country and dense infestations are to be found in riverbeds and disturbed areas close to most towns. The most densely infested areas known are the Omaruru River, 25 km up- and downstream from Omaruru; the Oanib and Usib Rivers near Rehoboth and the Avis Dam near Windhoek.

All river courses and disturbed areas are potential habitat. Seeds are water dispersed and they may also be dispersed by birds.

This species is not thought to compete with indigenous plants to any great extent as it occurs in rivers and disturbed areas where very little else grows. No attempt has been made to clear any Argemone infestations. Young plants of this species are eaten by goats, sheep and springbok.

Chenopodium ambrosioides (Map 6). This species is fairly widespread, especially in the central and western regions of the country. It is found mainly in river courses and around dams. No control has been attempted.

Datura ferox (Map 7) and Datura stramonium (Map 9). Infestations of these species are widespread over the whole country, but are most dense in urban areas, in rivers and in disturbed areas. All rivers and disturbed areas are potential habitat.

Seeds are distributed by birds and by water flow along the rivers. Competition with the indigenous vegetation is minimal, although Datura may threaten the herbaceous plants of the river banks. No control of these species has been attempted.

Dodonaea viscosa. This species was introduced as a garden ornamental. Light to moderate infestations occur in the Grootfontein townlands and on adjacent farms (locus 1918CA).

This species grows in disturbed areas and occurs interspersed with the indigenous vegetation, thus making control by chemicals very difficult.

Flaveria bidentis (Map 10). This species is fairly widespread along road verges, in townlands and in drainage areas. It is not considered a particularly aggressive invader and no control has been attempted.

Lantana camara (Map 11). These plants were, and still are, planted as ornamentals in gardens from whence they escape.

Light infestations occur in the Grootfontein district, viz the townlands of Grootfontein and on farms GR 777 and Berg Aukas. The plants are scattered and at present do not pose a threat to the indigenous vegetation. Experience from South Africa and elsewhere, however, has shown that Lantana can become a serious problem.

Seeds are distributed by birds and kudu Tragelaphus strepsiceros which makes the whole of the mountain savanna region in this area a potential habitat.

Control has not been attempted. When it does become necessary, biological control methods should be applied, since such methods are available. To limit the further spread of this species, no Lantana should be sold at nurseries.

Melia azedarach (Map 12). Light to moderate infestations of this species occur on the farms Annenhof and Omombonde East in the Grootfontein district, along a seven kilometre length of a tributary of the Omuramba Omatako. This species is considered to pose a threat to the indigenous vegetation of this area. Invasion of the extensive Omuramba Omatako is a definite possibility. Seeds are washed down the river and germinate in large numbers. Seed-eating birds, especially grey loeries Corythaixoides concolor, also disperse the seeds.

The farmer on whose farm the infestation occurs claims that his livestock feed on the plants all year round. Steyn (1934) states, however, that the leaves and seeds can be poisonous to animals at certain times of the year but that toxicity varies seasonally and from year to year.

No control measures have as yet been applied, as the infestation was only recently discovered.

Nicotiana glauca (Map 13). This species is widespread in the western, low rainfall areas of SWA/Namibia. Moderate infestations occur along main roads and rivers. It very easily infests cultivated lands. All main roads and river courses are potential habitats. This species is not known to threaten the indigenous flora and no control has been attempted.

Opuntia aurantiaca. This species is cultivated as an ornamental in gardens. Parts of the plant are often dumped outside towns and single plants occur near most towns. This species has the potential to become a serious problem and control should be attempted while it is still fairly easy.

Opuntia engelmannii. This species was introduced as a garden ornamental species in 1922 by Mr Rusch of the farm Lichtenstein in the Windhoek district. The species escaped and infested the farm. It has been recorded from the following loci: 2217AC, CA and CC.

Currently a large area along a river is very densely infested. Baboons and the seasonal flow of water seem to be the main causes of the spread of this species. In their attempts to reach the fruit, baboons tear off cladodes and scatter them, and new plants grow from these fallen cladodes. The baboons eat the fruit and are thought to disperse viable seeds in this way. The species out-competes indigenous plants in this area.

In November 1983 a small area of plants was infested with eggs of the insect Cactoblastis cactorum. The results were disappointing. Control is hampered by the fact that the plant occurs on cliffs. As O engelmannii does not create serious problems in South Africa, no specific research has been done on its biological control. Nevertheless, experiments are now underway at the Uitenhage Weed Laboratory to try to find a suitable biocontrol agent.

Opuntia ficus-indica (Map 14). This species was originally introduced as a drought fodder plant, as well as for its edible fruit. It competes aggressively with the indigenous vegetation.

The areas presently infested are in the Omaruru and Grootfontein districts. Moderately dense infestations occurs in the Omaruru River, about 25 km up- and downstream of Omaruru township. A few farms near Grootfontein are infested, with the farm Hoba West being densely infested.

The species spreads fairly rapidly since it can propagate vegetatively as well as by seed. Potential habitat includes the length of the Omaruru River, and (in the Grootfontein district), the farms bordering on the infested areas.

Biological control using cochineal Dactylopius opuntiae has been attempted in both these areas. At Hoba West where cochineal was introduced in 1983, half of the plants were infested by the insect after about a year. At Omaruru the introduction of cochineal has been less successful. As biological control techniques have been developed for Opuntia spp, these methods should be employed in preference to chemical control methods wherever possible.

In order to prevent Opuntia being planted as drought fodder, research should be undertaken to find a suitable alternative.

Opuntia stricta. This species was originally introduced for its fruit.

Light infestations occur on the farms Rietfontein and Berg Aukas in the Grootfontein district. It has been recorded from the following loci: 1917DD, 1918AC and CA. The species out-competes indigenous plants of this area.

O stricta is difficult to control locally as it occurs in mountainous terrain. In 1975, however, cochineal was introduced on the farm Rietfontein and by 1984 almost the entire infestation had been destroyed.

Pennisetum setaceum. This species was introduced as a garden ornamental from whence it escaped.

Dense infestations occur along roads and in disturbed areas at the entrance routes to Grootfontein, Tsumeb and Kombat for up to 20 km from the towns. Light infestations occur on the entrance routes to Windhoek. It has been recorded from the following loci: 1917BC, DA, DB, 1918CA, 2016BC, 2216DB and 2217CA.

At present the species is no threat to indigenous vegetation, as it only occurs along roads where the vegetation has been disturbed or cleared anyway.

All roadsides are potential habitat. Seeds are distributed by wind and water and germinate readily.

No attempt has been made to clear these infestations.

Prosopis spp (Map 15). This plant was introduced in 1912 by Prof K Dinter, to be planted as a fodder tree. Since this time it has spread over almost the entire country. This extremely drought-resistant plant competes with indigenous vegetation. Avian diversity is also influenced, particularly where Prosopis often forms almost monospecific stands.

At present most townlands are infested to some extent, the areas around Windhoek, Okahandja and Rehoboth having the densest infestations. The townlands of Gibeon, Tses, Kalkrand, Mariental, Keetmanshoop and Usakos are less heavily infested. Dense infestations also occur in the White and Black Nossob Rivers. As the seeds of Prosopis are dispersed by water, most of the major seasonal drainage lines arising on or passing through farmlands or townlands are infested. Rivers owned by the state and/or municipalities, especially those entering conservation areas, should be cleared of this species, for example the Khan River should be cleared by the Usakos municipality.

Seeds are also dispersed by animals which eat the very nutritious pods. Germination of ingested, undamaged seed occurs readily and the spread of this species is therefore not limited to river courses. Research should be initiated to find an indigenous plant species which could replace Prosopis as a fodder plant. Acacia albida might be a possibility.

At present the Windhoek municipality attempts to control Prosopis with chemicals such as Tordon 125 and Tordon 225. These successfully kill Prosopis but the environmental side effects of the chemicals are not yet known.

Sesbania punicea. This species is cultivated in gardens in most towns. It could escape and infest areas of natural vegetation, particularly river courses. This species should not be sold at nurseries.

Tagetes minuta. Light infestations of this species are widespread in the central and central-northern areas of SWA/Namibia. This species occurs mainly in rivers and disturbed areas. It is not thought to compete with the indigenous vegetation. No control has been attempted.

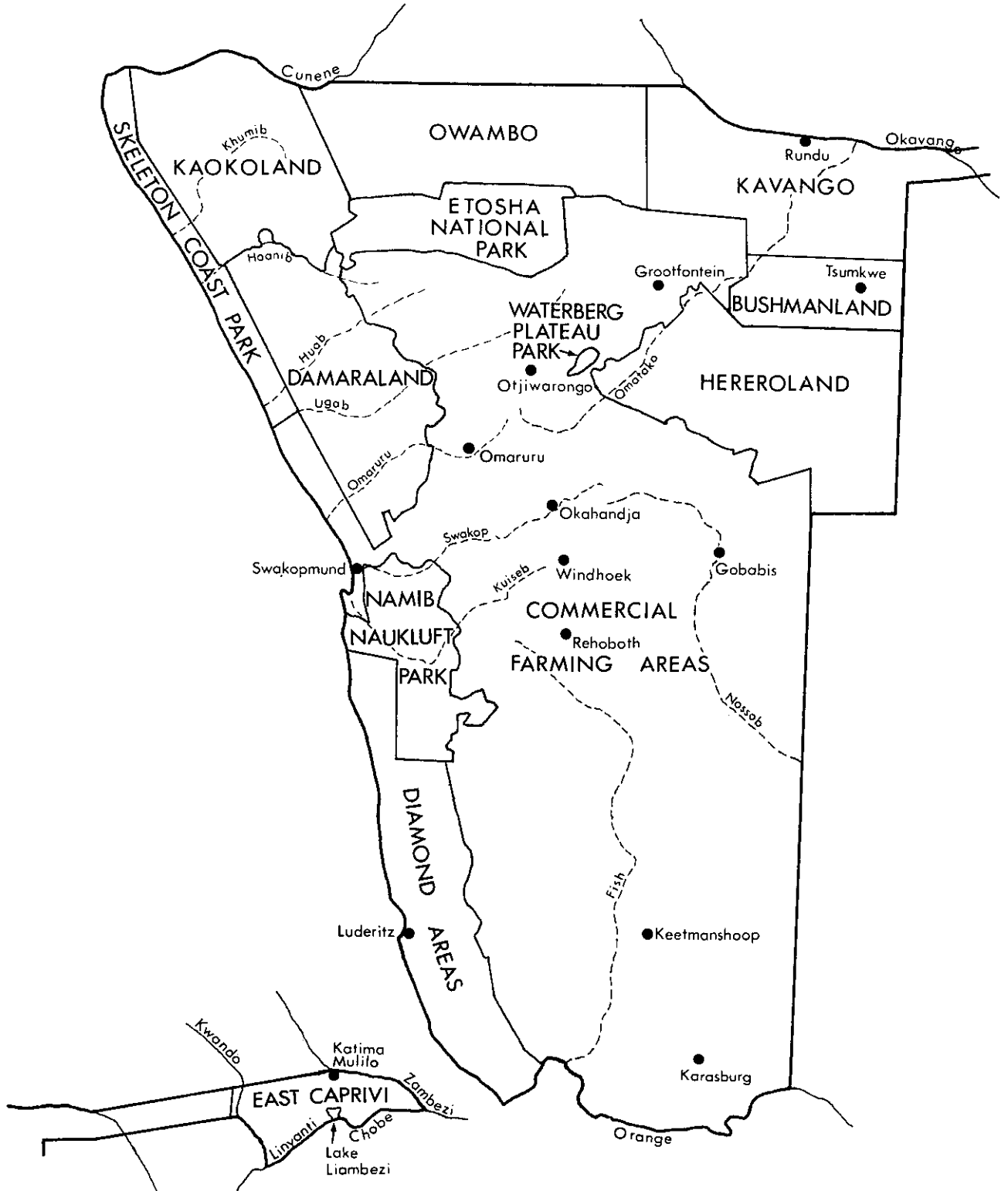
Xanthium spinosum (Map 18). Light to moderate infestations of this species are found in river courses, urban areas and heavily utilized agricultural areas such as cattle pens and near drinking troughs, mainly in the central and eastern regions of the country. The effect of X spinosum on the indigenous vegetation is not known and no control has been attempted.

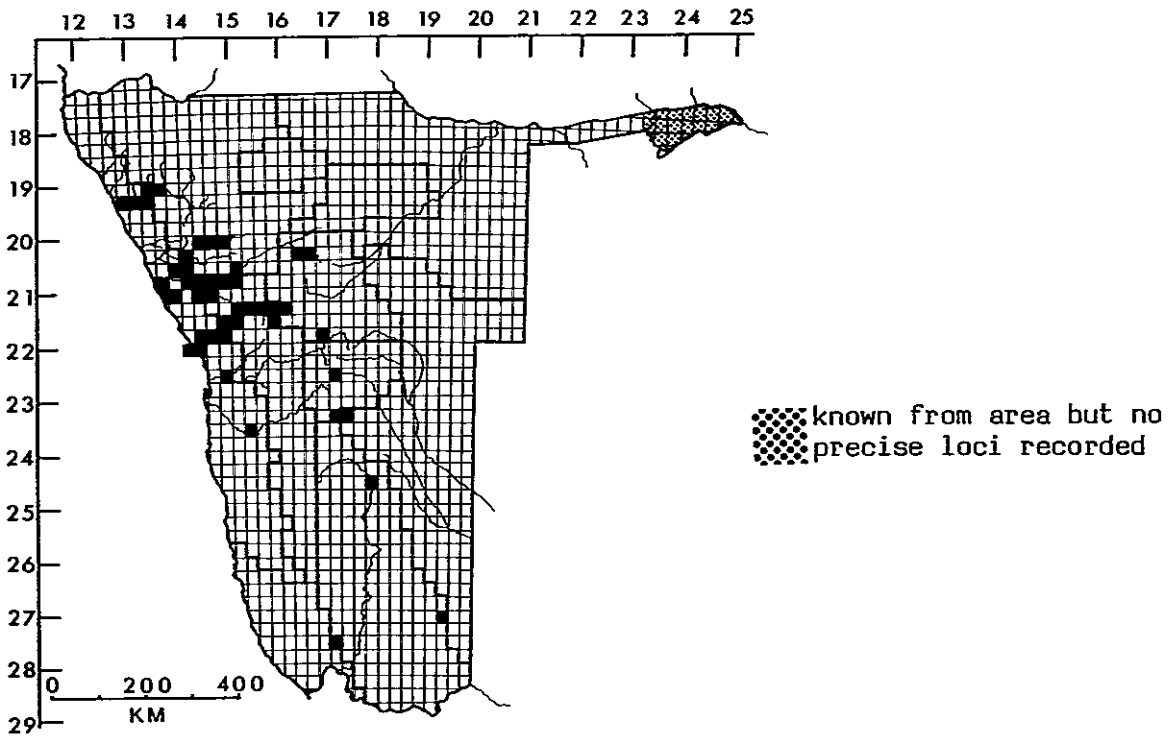
DISCUSSION

SWA/Namibia is fortunate in that, at present, it has relatively few serious problems with invasive alien plants. All possible efforts should be made to monitor and control those plant species which pose a threat of invasion.

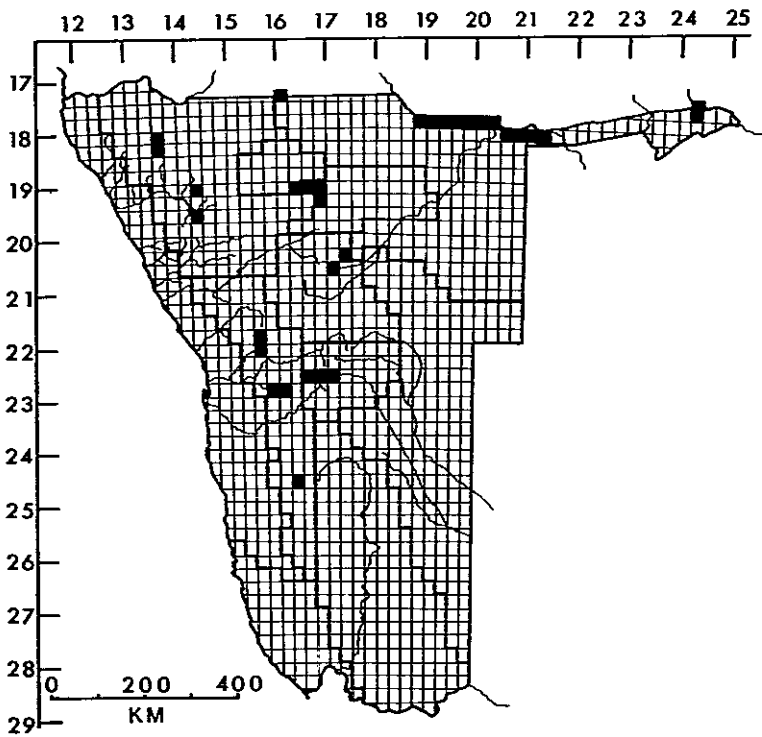
At present several species of alien plants with high invasive potential are sold at nurseries in SWA/Namibia. This practice should be halted immediately, and a ban should be placed on the sale of the following species: Lantana camara, Melia azedarach, Opuntia spp, Pennisetum setaceum, Prosopis spp and Sesbania punicea.

MAP 3. South West Africa/Namibia showing main place names mentioned in text.

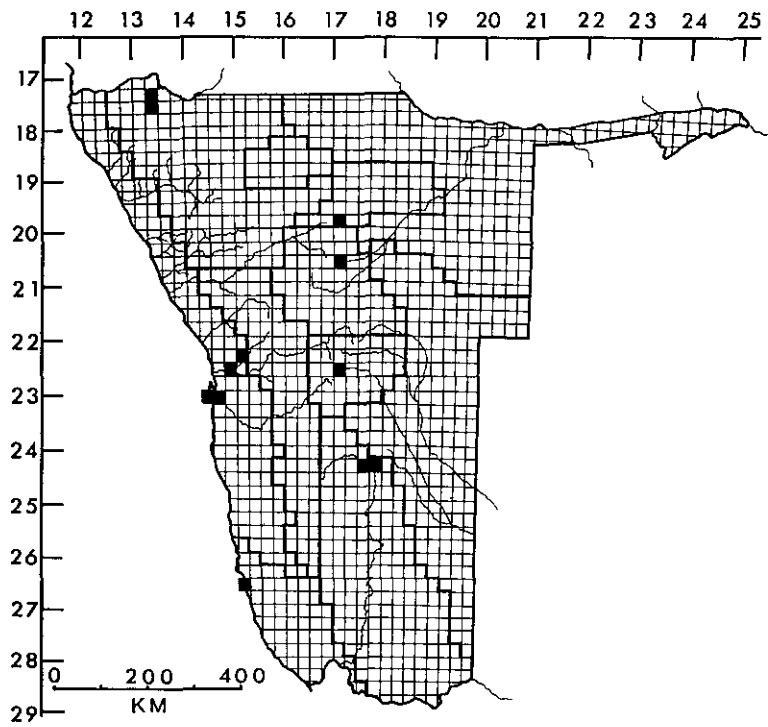




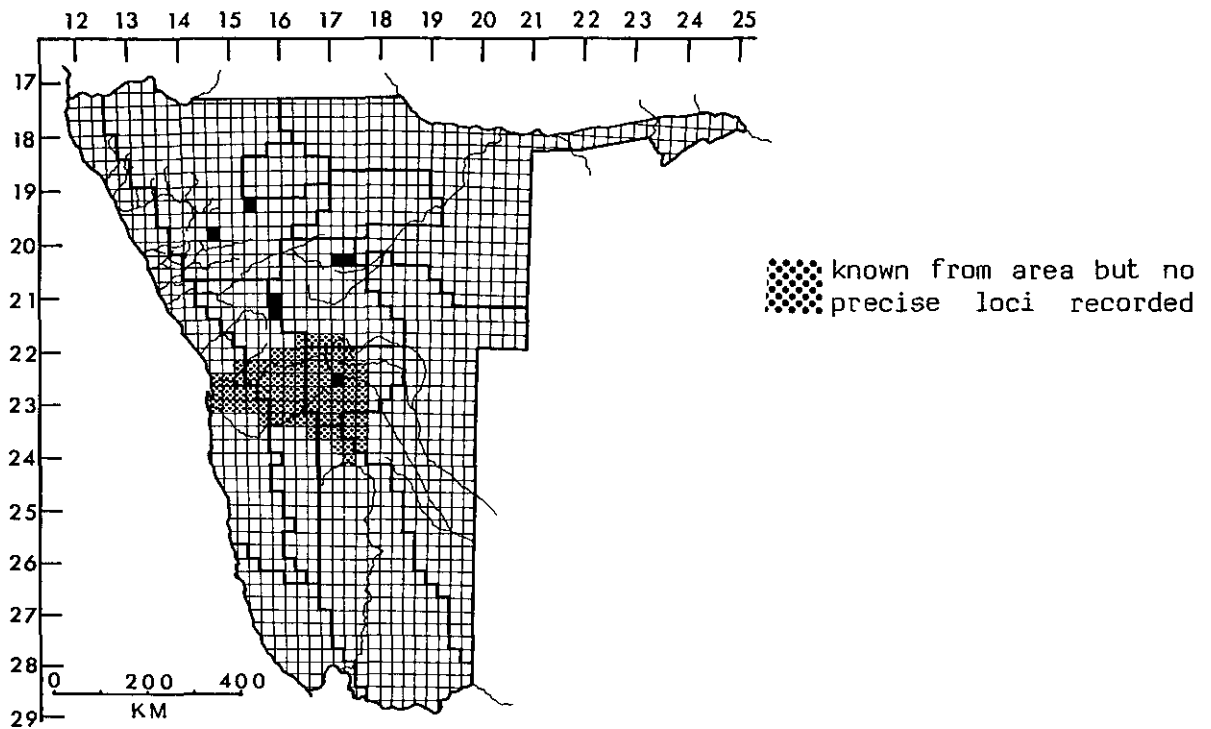
MAP 4. Distribution map of Argemone ochroleuca.



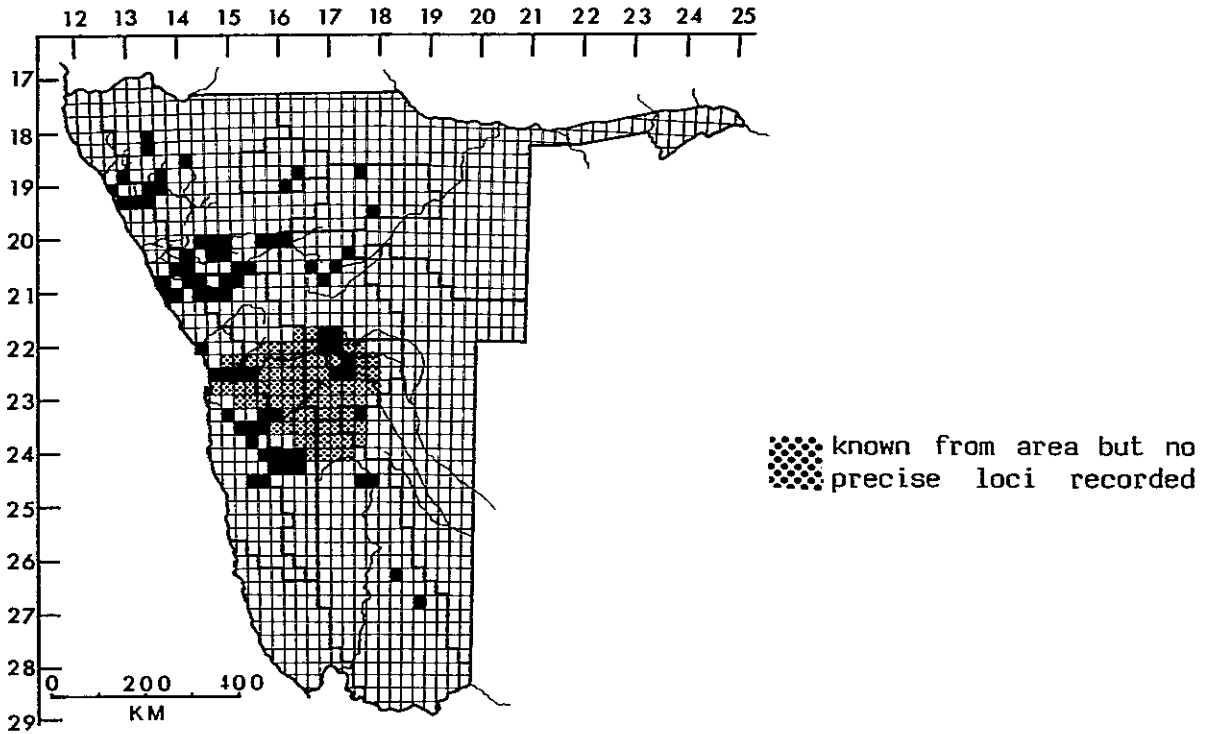
MAP 5. Distribution map of Bidens biternata.



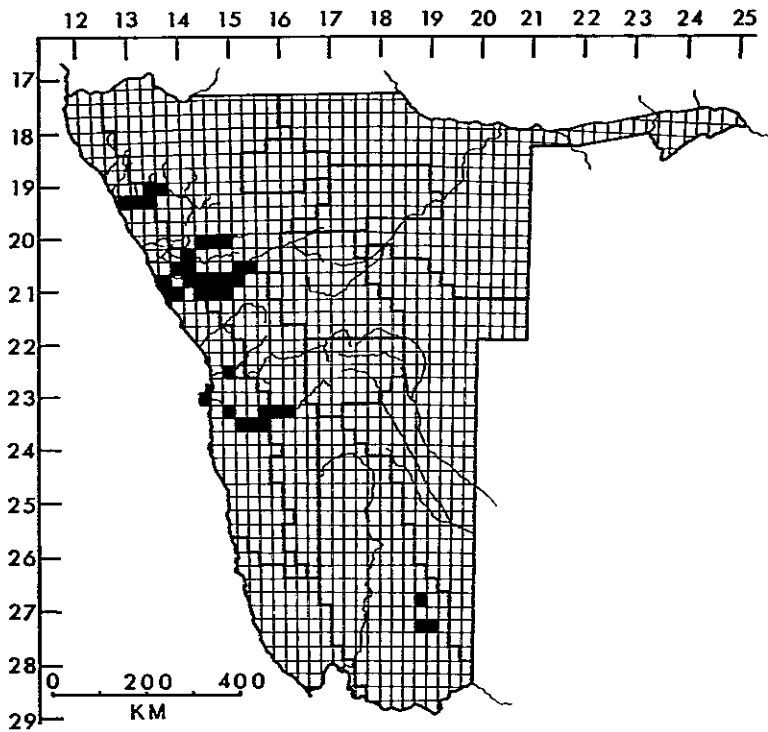
MAP 6. Distribution map of Chenopodium ambrosioides.



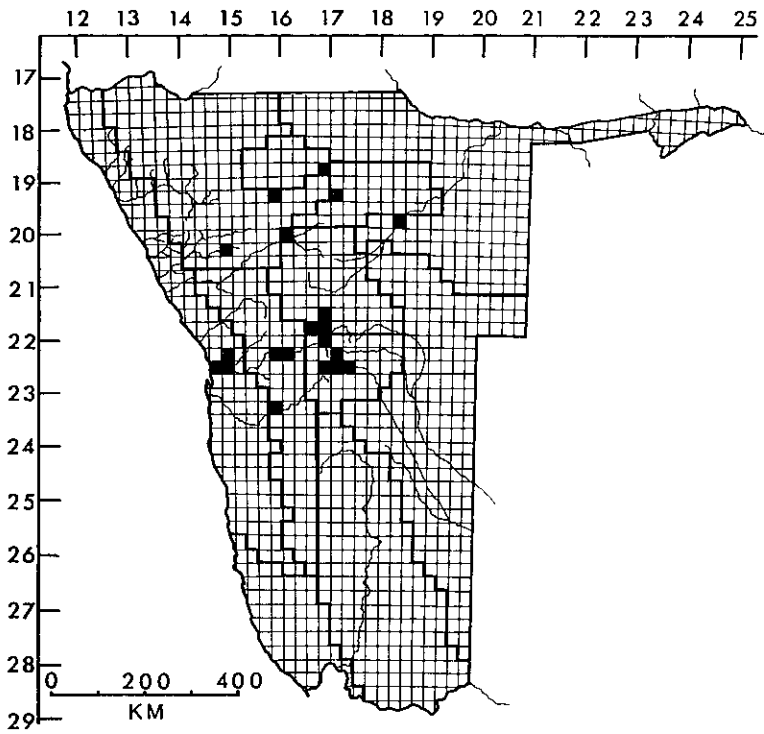
MAP 7. Distribution map of Datura ferox.



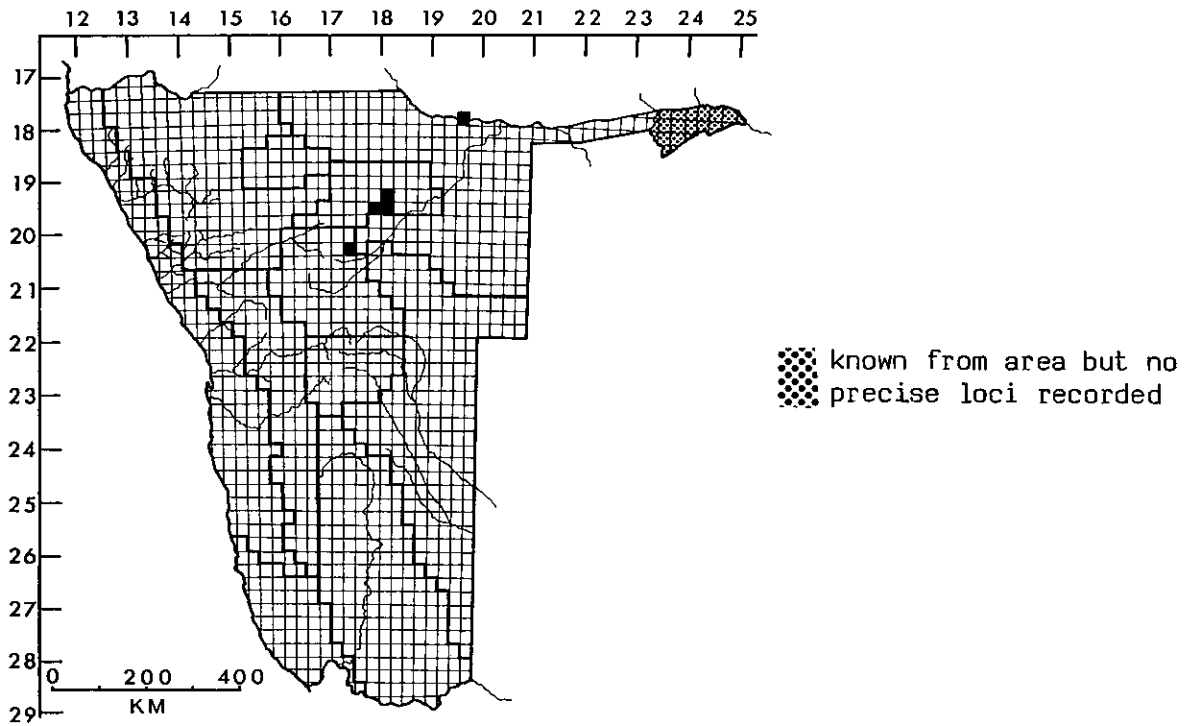
MAP 8. Distribution map of Datura innoxia.



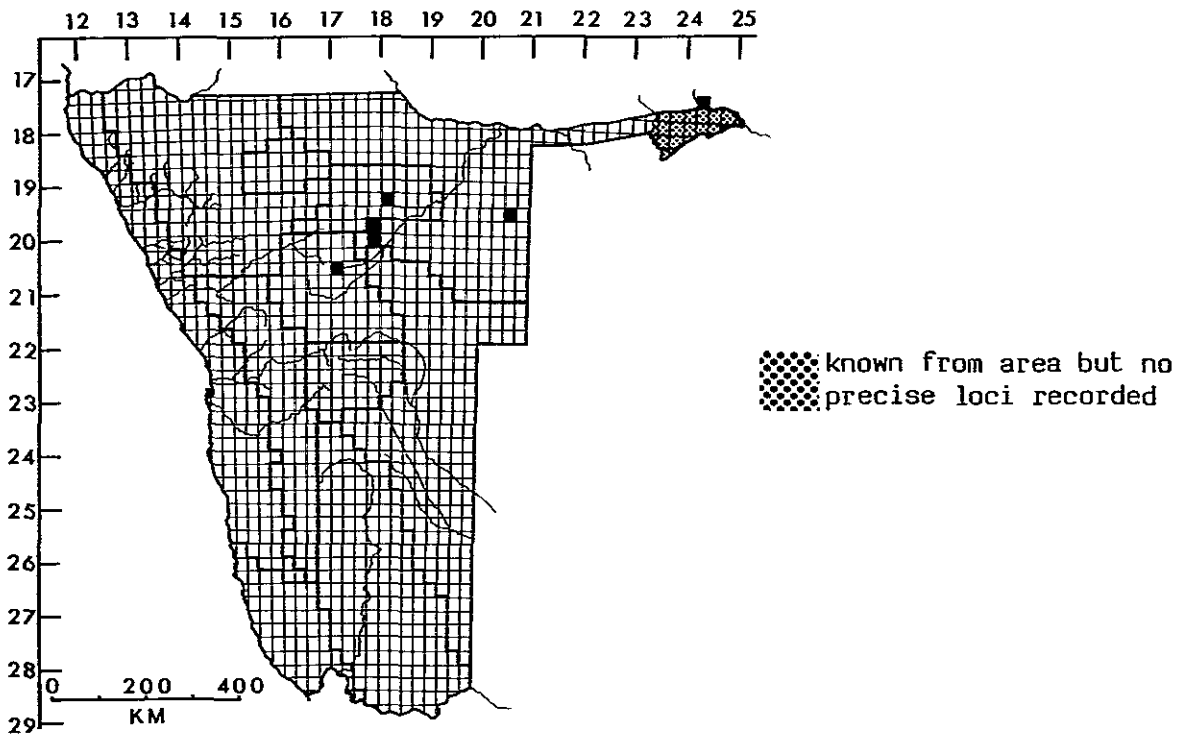
MAP 9. Distribution map of Datura stramonium.



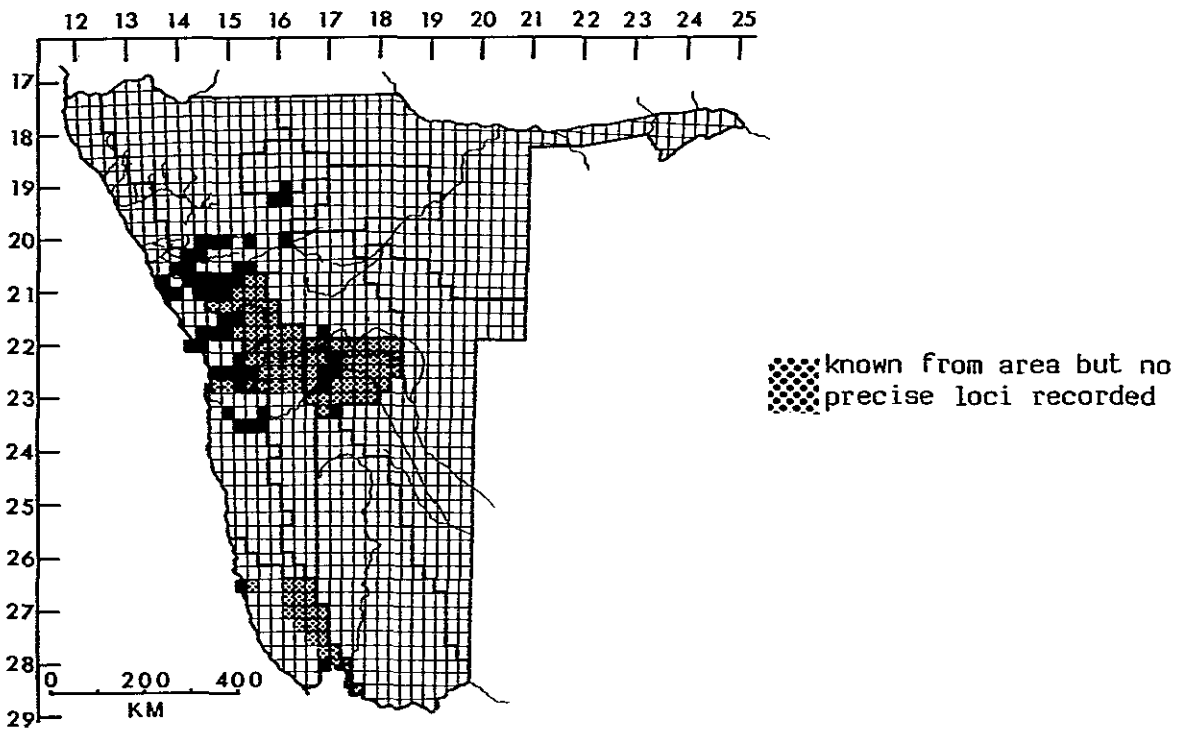
MAP 10. Distribution map of Flaveria bidentis.



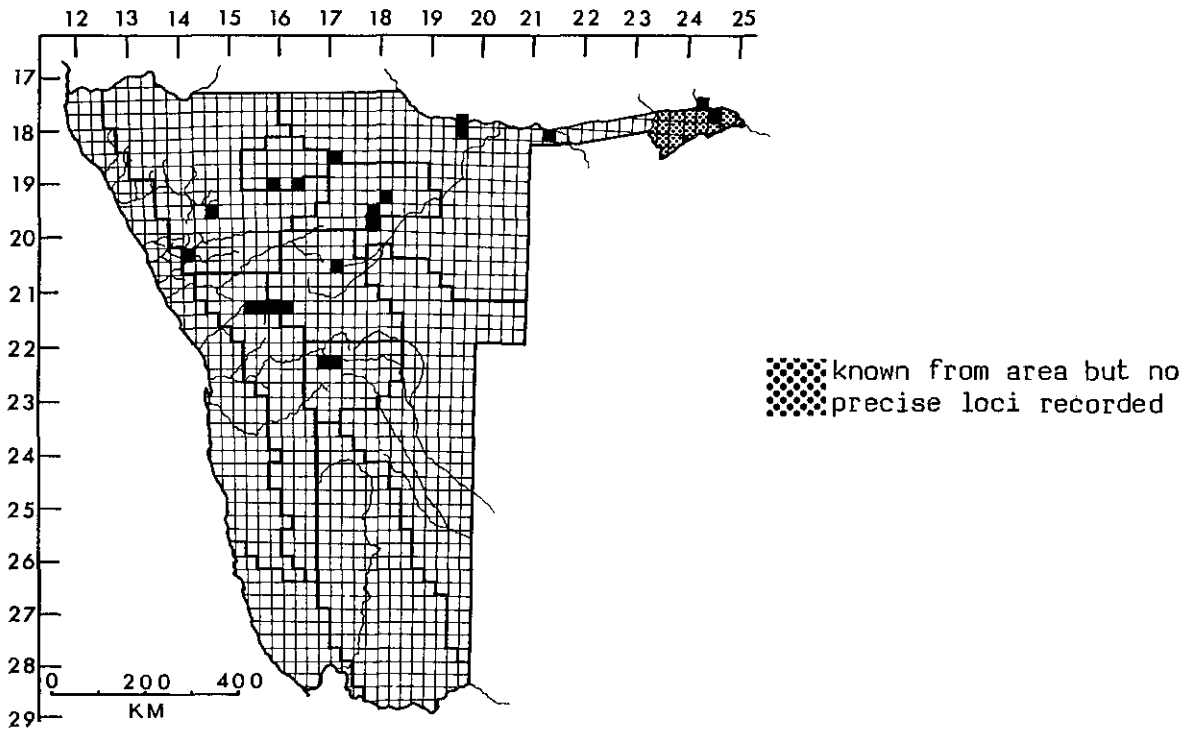
MAP 11. Distribution map of Lantana camara.



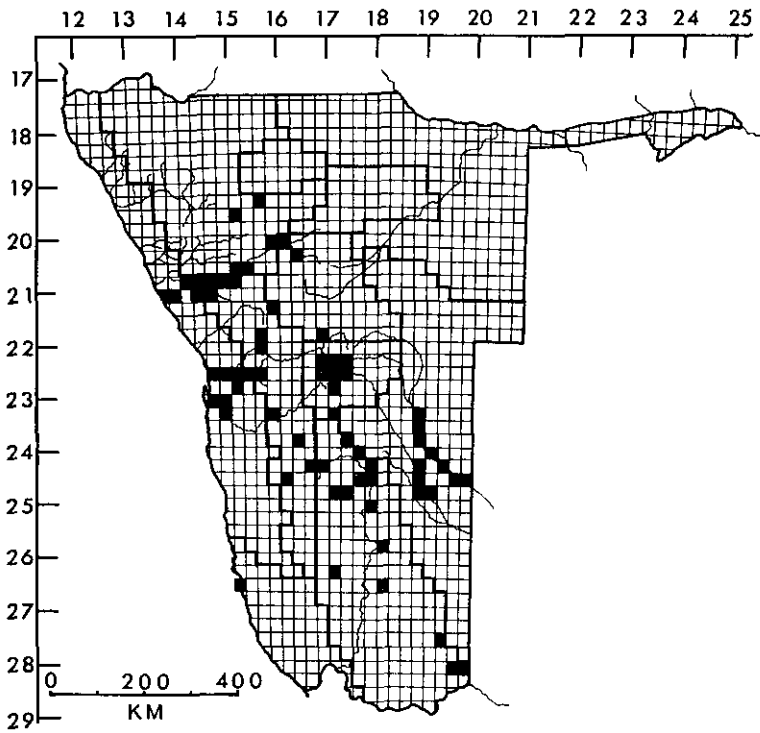
MAP 12. Distribution map of Melia azedarach.



MAP 13. Distribution map of Nicotiana glauca.



MAP 14. Distribution map of Opuntia ficus-indica.



MAP 15. Distribution map of Prosopis spp.