

CHAPTER 18

Family Typhlopidae

G. John Measey & William R. Branch

Relationships between the main basal groups within snakes have yet to be resolved. One lineage, the scolecophidians, comprises a number of families of so-called 'blind snakes'. A recent phylogeny of scolecophidians (Vidal *et al.* 2010) reveals a long Gondwanan history and an initial diversification of the group following the separation of East and West Gondwana. Subsequent radiation was accompanied by several oceanic dispersal events, while their exceptional diversification in the Cenozoic was probably linked to a parallel radiation of prey (ants and termites). The main clades of scolecophidians diverged in the Jurassic and Cretaceous between 159 and 97 million years ago, and the very deep genetic divergence between these clades has necessitated the recognition of two new scolecophidian families; the Xenotyphlopidae from Madagascar and the Gerrhopilidae from Sri Lanka to Papua New Guinea (Vidal *et al.* 2010).

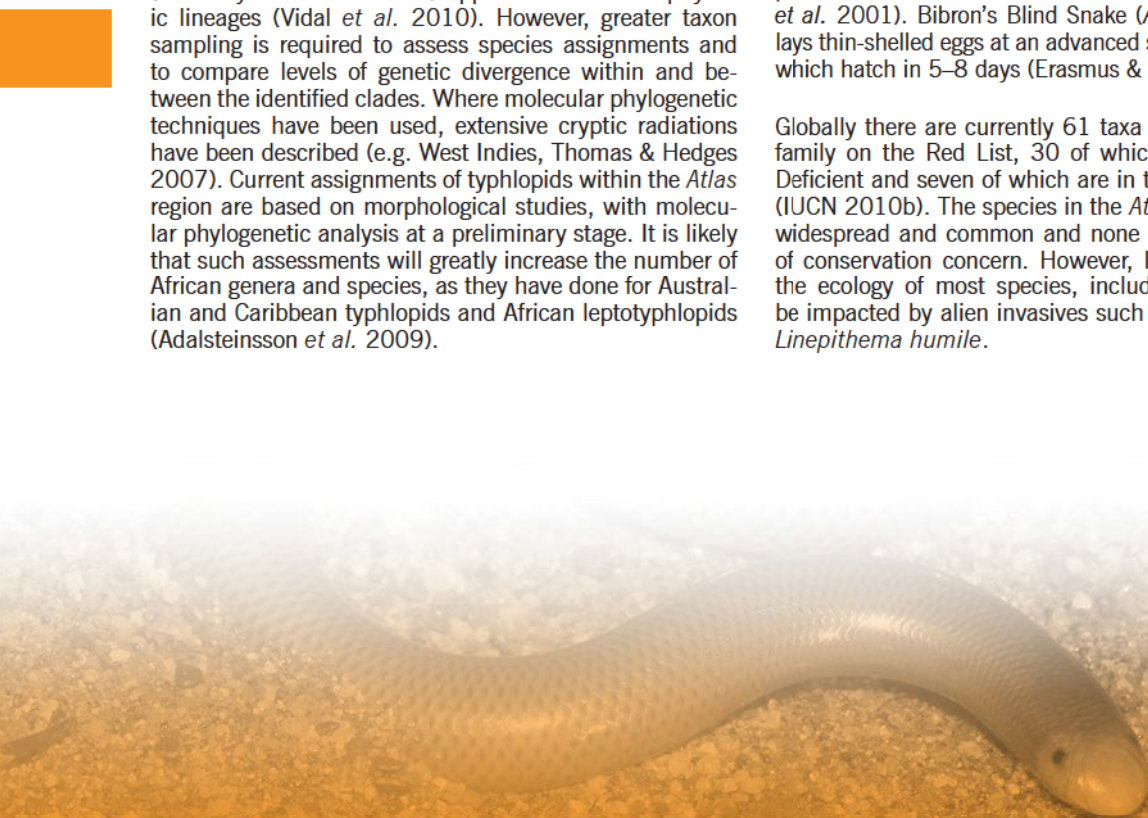
The Typhlopidae is the most diverse scolecophidian family and comprises small- to large-bodied snakes (252 species in 10 genera, Uetz 2012). Scolecophidians typically have conservative morphologies and it is therefore often difficult to distinguish between species. This has probably led to an under-appreciation of their diversity. A preliminary phylogeny of the family (Vidal *et al.* 2010) recovered multiple examples of paraphyly that will require nomenclatural revision.

The two new genera *Afrotyphlops* and *Megatyphlops*, and the genus *Rhinotyphlops*, proposed for African typhlopids (Broadley & Wallach 2009) appear to form monophyletic lineages (Vidal *et al.* 2010). However, greater taxon sampling is required to assess species assignments and to compare levels of genetic divergence within and between the identified clades. Where molecular phylogenetic techniques have been used, extensive cryptic radiations have been described (e.g. West Indies, Thomas & Hedges 2007). Current assignments of typhlopids within the *Atlas* region are based on morphological studies, with molecular phylogenetic analysis at a preliminary stage. It is likely that such assessments will greatly increase the number of African genera and species, as they have done for Australian and Caribbean typhlopids and African leptotyphlopids (Adalsteinsson *et al.* 2009).

Typhlopids are cosmopolitan, with their core distribution in the tropics. Few species occur in temperate areas in either hemisphere. Within the *Atlas* region, four genera are known. One of these, *Ramphotyphlops*, has a single species (Brahminy Blind Snake, *R. braminus*) introduced from Asia. It is not assessed here although an account is presented. *Ramphotyphlops braminus* is parthenogenetic and has apparently spread around the world with horticultural products such as potted plants. The other three genera are *Afrotyphlops* (16 species, two in the *Atlas* region), *Megatyphlops* (four species, two in the *Atlas* region) and *Rhinotyphlops* (four species, two in the *Atlas* region). Some species are widespread (e.g. *R. lalandei*) while others (e.g. *A. fornasinii*) have restricted ranges.

Blind snakes are characterised by tubular bodies, very short tails, uniform scalation around the body, and reduced eyes covered by head shields. Most species are pink or brown, often with irregular dark blotches. Although most species in the family are small, two of the species in the *Atlas* region, namely *M. schlegelii* and *M. mucruso*, are among the largest blind snakes, growing to 1 m in length. This is reflected in their new generic name, *Megatyphlops* (Broadley & Wallach 2009). The mouths of blind snakes are characteristically very small and they use the toothed maxillary bones of their upper jaws to rake in large numbers of small prey very quickly (Webb & Shine 1993; Kley 2001). These harmless snakes are non-venomous and live underground where they prey on social insects such as ants and termites (Webb *et al.* 2001). In most species, females lay 4–25 eggs per clutch in late summer and these hatch in autumn (Webb *et al.* 2001). Bibron's Blind Snake (*A. bibronii*), however, lays thin-shelled eggs at an advanced stage of development, which hatch in 5–8 days (Erasmus & Branch 1983).

Globally there are currently 61 taxa in this poorly-known family on the Red List, 30 of which are listed as Data Deficient and seven of which are in threatened categories (IUCN 2010b). The species in the *Atlas* region are mostly widespread and common and none are considered to be of conservation concern. However, little is known about the ecology of most species, including how they might be impacted by alien invasives such as the Argentine Ant *Linepithema humile*.



Genus *Afrotyphlops* Broadley & Wallach, 2009—African blind snakes

Afrotyphlops is a genus of sub-Saharan blind snakes containing 16 species (Broadley & Wallach 2009). The two local species (*A. bibronii*, *A. fornasinii*) both occur in the eastern half of the *Atlas* region. They live underground and feed mostly on ant pupae, which are raided

from nests (Webb *et al.* 2001). Females lay 5–14 eggs per clutch; eggs of *A. bibronii* hatch after only 5–8 days (Erasmus & Branch 1983; Branch 1998). Both species are common and wide-ranging and are thus not considered threatened.

Afrotyphlops bibronii (A. Smith, 1846)

BIBRON'S BLIND SNAKE

G. John Measey

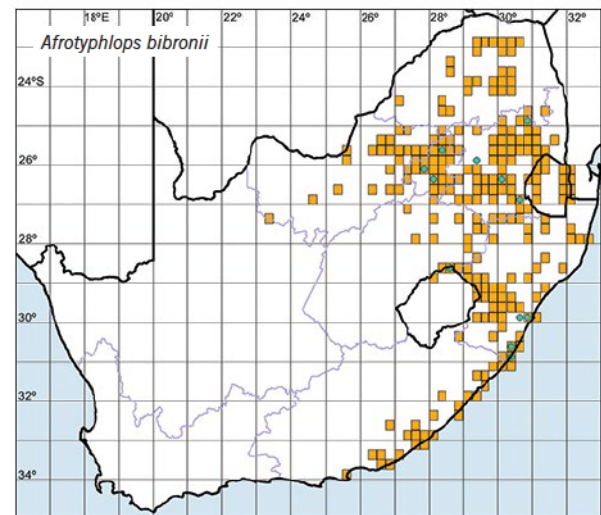
Global: Least Concern

Near-endemic

Taxonomy: Previously known as *Typhlops bibronii*, but placed in the new endemic African genus *Afrotyphlops* by Broadley & Wallach (2009). The taxonomic status of the isolated population in eastern Zimbabwe should be investigated using molecular techniques.

Distribution: Endemic to southern Africa, occurring mainly in the eastern half of the *Atlas* region and in extreme eastern Botswana (Broadley & Wallach 2009). A relict population exists in eastern Zimbabwe and another may be present in adjacent Mozambique (Broadley 1990b). *Atlas* data suggest that this species also occurs in the southern-most parts of Mozambique.

Habitat: Burrows in loose soil and apparently moves into surface soils in search of macro-invertebrate prey items, especially after rain (Broadley 1990b). Found in old termitaria, and in or on soil under rocks and rotting logs (De Waal 1978; Jacobsen 1989). Occurs at altitudes of 0–2 000 m (Broadley & Wallach 2009).



Biome: Grassland; Savanna; Indian Ocean Coastal Belt; Albany Thicket.

Assessment rationale: Widespread and common.

Conservation measures: None recommended.



Afrotyphlops bibronii—near Wolkberg hut, Wolkberg Wilderness Area, LIMP
M. Burger



Afrotyphlops bibronii—Pretoria, GP

J. Marais

***Afrotyphlops fornasinii* (Bianconi, 1849)**
FORNASINI'S BLIND SNAKE

G. John Measey

Regional: Least Concern

Taxonomy: Previously known as *Typhlops fornasinii*, but placed in the endemic African genus *Afrotyphlops* by Broadley & Wallach (2009). The taxonomic status of the insular populations off the coast of Mozambique should be investigated using molecular techniques, as should the population in southeastern Zimbabwe.

Distribution: Endemic to southern Africa. Found on the coastal plains of northern KwaZulu-Natal and southern Mozambique as far north as Maputo and the adjacent offshore islands. An isolated population occurs in southeastern Zimbabwe (Broadley 1990b; Branch 1998; Broadley & Wallach 2009).

Habitat: Found in coastal sand associated with leaf litter (Branch 1998), at altitudes of 0–100 m (Broadley & Wallach 2009).

Bioregion: Indian Ocean Coastal Belt; Lowveld.

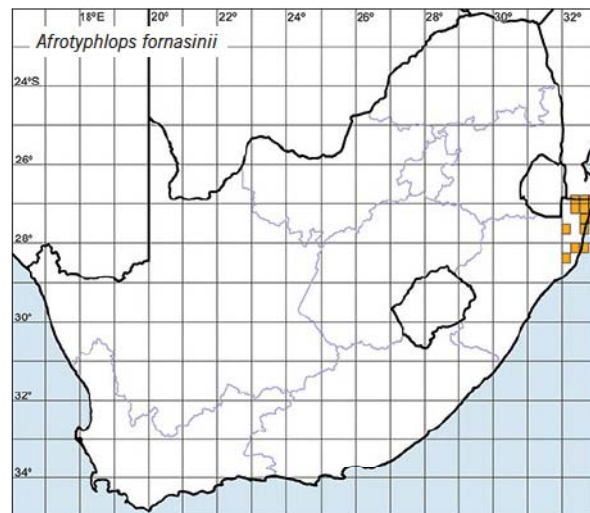
Assessment rationale: This species has a small EOO (5 000 km², on the Endangered threshold) and fairly small AOO (4 000 km²) within the *Atlas* region (both estimates made with a low level of confidence). However, it is common and appears to be tolerant of moderate habitat change.

Conservation measures: None recommended.



Afrotyphlops fornasinii—St Lucia, KZN

J. Marais



Genus *Megatyphlops* Broadley & Wallach, 2009—giant blind snakes

Megatyphlops is an African genus comprising four species (Broadley & Wallach 2009), two (*M. schlegelii*, *M. mucroso*) of which are present in the *Atlas* region. As their name suggests these are large snakes (up to 1 m long), and *M. mucroso* is the largest of all blind snakes. The other mem-

bers of the genus occur elsewhere in eastern and southern Africa. These snakes live much deeper underground than other scolecophidians and are seldom seen. Females usually lay clutches of 12–40 eggs (Branch 1998). They are widespread and not considered to be threatened.

Megatyphlops mucroso (Peters, 1854)

ZAMBEZI GIANT BLIND SNAKE;
ZAMBEZI BEAKED BLIND SNAKE

G. John Measey

Regional: Least Concern

Taxonomy: Previously known by the name *Rhinotyphlops schlegelii mucroso*, but elevated to full species status and placed in the new genus *Megatyphlops* by Broadley & Wallach (2009).

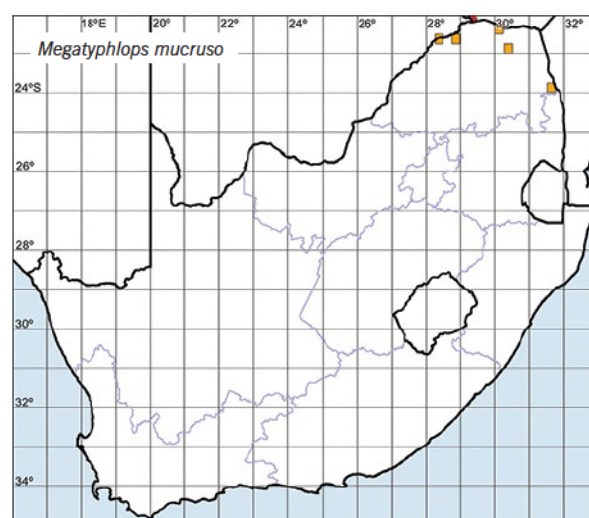
Distribution: Found in northern Limpopo, South Africa, extending northwards through Zimbabwe, central and northern Mozambique, to coastal Kenya and into the southern Congo basin, including northeastern Angola (Broadley 1990b; Broadley & Wallach 2009). The record in QDGC 2331DC should be checked as it falls within the range of the closely-related *M. schlegelii*.

Habitat: Uses its horny beak to penetrate hard substrates, including termitaria. Occurs at altitudes of 250–900 m in Limpopo (Jacobsen 1989), and elsewhere at 0–1 740 m (Broadley & Wallach 2009).

Bioregion: Mopane; Lowveld.

Assessment rationale: Has a fairly restricted range within the *Atlas* region but is probably common and does not appear to be threatened. Outside this region it is also likely to be Least Concern.

Conservation measures: None recommended.



Megatyphlops mucroso—Waterpoort, LIMP

W.D. Haacke

Megatyphlops schlegelii (Bianconi, 1847)

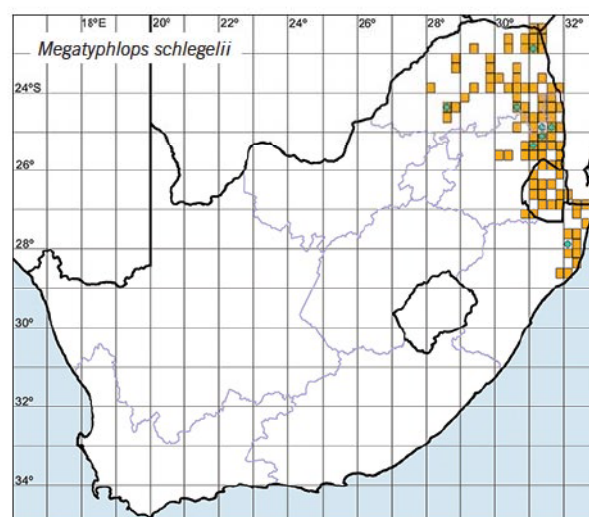
SCHLEGEL'S GIANT BLIND SNAKE;
SCHLEGEL'S BEAKED BLIND SNAKE

G. John Measey

Regional: Least Concern

Taxonomy: Until recently, four subspecies were recognised under the name *Rhinotyphlops schlegelii* (*schlegelii*, *petersii*, *mucroso*, *brevis*; see Hahn 1980), but the latter two have now been elevated to species status within the genus *Megatyphlops* (Broadley & Wallach 2009). *Rhinotyphlops s. petersii* is considered a junior synonym of *M. schlegelii* (Broadley & Wallach 2009). It would be worthwhile to test the hypotheses proposed in the morphology-based taxonomic revision by means of a molecular investigation of all species in the genus.

Distribution: Endemic to the southern half of Africa. Found in Limpopo, eastern Mpumalanga, Swaziland and north-



eastern KwaZulu-Natal, as well as southern Mozambique, eastern Botswana, northern Namibia and southern Angola (Broadley & Wallach 2009). Broadley & Wallach (2009) omitted an isolated cluster of records from Gauteng (see Broadley 1990b) and these records have also been excluded from the current assessment. They may, however, require further investigation.

Habitat: Uses its hardened beak to burrow into compact soil, including termitaria, in search of its social macro-invertebrate adult and larval prey (Kley 2001). Most often seen when crossing roads after rain; occurs at altitudes of 200–1 200 m in Limpopo and Mpumalanga (Jacobsen 1989) and 0–200 m in KwaZulu-Natal (Bourquin 2004).

Biome: Savanna; Grassland; Indian Ocean Coastal Belt.

Assessment rationale: Widespread and common.

Conservation measures: None recommended.



Megatyphlops schlegelii—Klaserie, LIMP

D. Pietersen

Genus *Ramphotyphlops* Fitzinger, 1843—Australasian blind snakes

Ramphotyphlops is a genus of Australasian blind snakes currently containing 27 species (Uetz 2012), most of which occur in Australia. These snakes are restricted to Southeastern Asia, the Philippines, Indonesia, Papua New Guinea, and islands of the Indian and western Pacific Oceans, except for *R. braminus* (see below) which has been introduced throughout tropical and subtropi-

cal regions of the world (Broadley & Wallach 2009). Males are characterised by an unusual hemipenis with a solid terminal awn (McDowell 1974), while females of all species—except the all-female parthenogenetic *R. braminus*—are oviparous and lay small clutches of eggs, usually about 13 but exceptionally up to 34 (Shine & Webb 1990).

Ramphotyphlops braminus (Daudin, 1803)

BRAHMINY BLIND SNAKE; FLOWERPOT SNAKE

William R. Branch

Not Applicable

Taxonomy: Paradoxically, this was one of the first snake species to be recorded from South Africa (as *Onychocephalus Capensis* Smith, 1838). It was first recognised as being referable to *Typhlops* (= *Ramphotyphlops*) *braminus* by McLachlan (1978b) based on the existence of a population on the Cape Peninsula.

Distribution: Found in South East Asia from Philippines to northern Australia and now also known to have been transported to numerous other countries (Broadley & Wallach 2009). Found on the East African coastal plain from Somalia to Beira in Mozambique, with isolated populations now established in Durban and Cape Town. Recently introduced into Egypt (Baha el Din 1996), Central African Republic (Chirio & Ineich 1997) and Libya (Joger *et al.* 2008). In most areas it is restricted to the coastal plain (Branch 1998), but in Tanzania it is known from localities almost 200 km inland (Loveridge 1955). Reported from Cape Town by McLachlan (1978b) and subsequently from Durban by Alexander (1987). Recently found inland in the Western Cape, at Worcester (3319CB) in 1997, and Porterville (3318BB) in 2002 (Turner *et al.* 2007).

Habitat: Usually found in urban gardens where it burrows in moist soil under rocks and rotting logs (Branch 1998). McDowell (1974) first demonstrated that this is an all-female species and the only known parthenogenetic, triploid snake.

Biome: Fynbos, Indian Ocean Coastal Belt.

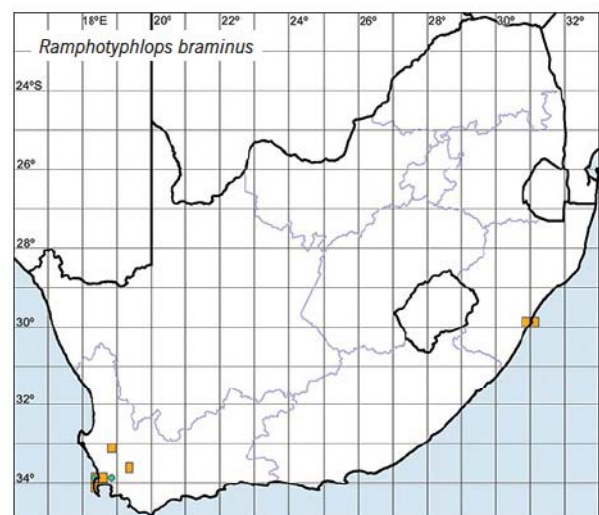
Assessment rationale: Not assessed as it is an introduced species.

Conservation measures: None recommended.



Ramphotyphlops braminus—Durban, KZN

J. Marais



Genus *Rhinotyphlops* Fitzinger, 1843—beaked blind snakes

Rhinotyphlops is endemic to central, eastern and southern Africa, and contains four species (*R. lalandei*, *R. schinzi*, *R. boylei*, *R. leucocephalus*). The first two species occur in the *Atlas* region, whereas *R. boylei* is restricted to Namibia and Botswana, and *R. leucocephalus* is restricted to Somalia (Broadley & Wallach 2009). *Rhi-*

notyphlops boylei may occur in the Mier-Kalahari of the Northern Cape. These harmless snakes live underground and feed on termites and ant brood (Webb *et al.* 2001). Females lay small clutches of 2–4 eggs (Branch 1998). Neither species in the *Atlas* region is considered to be threatened.

Rhinotyphlops lalandei (Schlegel, 1839) DELANDE'S BEAKED BLIND SNAKE

G. John Measey

Regional: Least Concern

Taxonomy: The taxonomy would be improved by a molecular-based revision of the relict populations in Namibia.

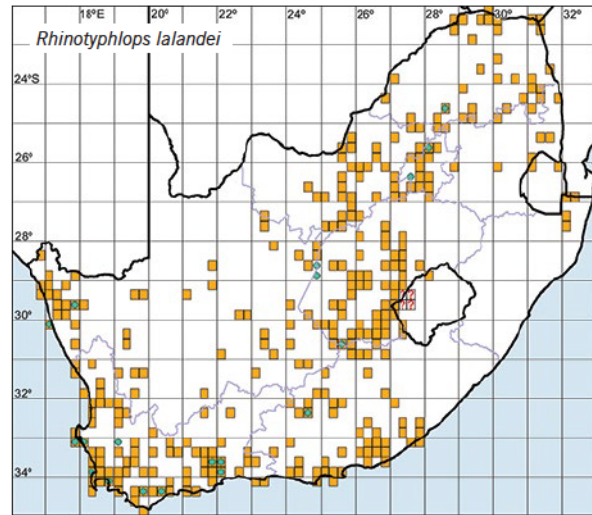
Distribution: Widespread but endemic to southern Africa, occurring from northern Zimbabwe southwards to the Western Cape in South Africa. Also found in Swaziland, western Lesotho, southern Namibia, eastern Botswana and western Mozambique, with isolated populations in central Namibia (Broadley & Wallach 2009). In the *Atlas* region it appears to be absent from Kalahari sands and east of the Drakensberg. Some records in western Lesotho require confirmation.

Habitat: Fossorial, using its hard beak to burrow into firm substrates. It has been found under rocks and rotting logs and in moribund termitaria (De Waal 1978; Jacobsen 1989).

Biome: Grassland; Fynbos; Savanna; Succulent Karoo; Nama-Karoo; Albany Thicket.

Assessment rationale: Widespread and common.

Conservation measures: None recommended.



Rhinotyphlops lalandei—Kimberley, NC

D. Maguire



Rhinotyphlops lalandei—Farm Kalkfontein, about 25 km SSE of Steelpoort, MPM

M. Burger



Rhinotyphlops lalandei—near Alldays, LIMP

J. Marais

Rhinotyphlops schinzi* (Boettger, 1887)*SCHINZ'S BEAKED BLIND SNAKE**

G. John Measey

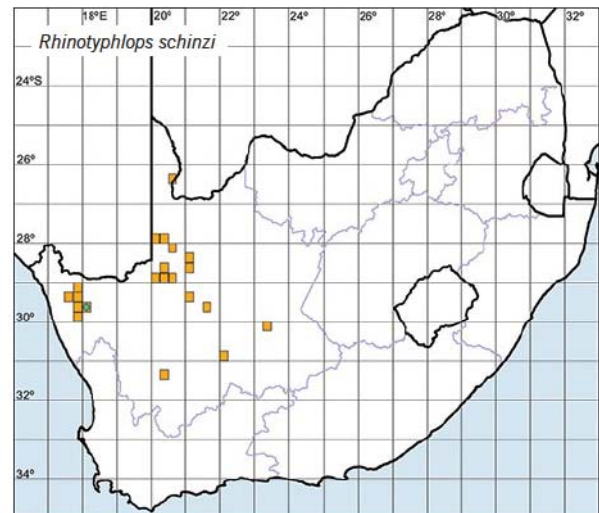
Regional: Least Concern**Taxonomy:** No notable issues.

Distribution: Endemic to Namibia, western Botswana and northwestern South Africa (Broadley 1990a; Broadley & Wallach 2009). Within the *Atlas* region it occurs only in the Northern Cape. Although not commonly encountered, it is likely to be more widespread than *Atlas* records suggest because the Northern Cape has not been comprehensively surveyed.

Habitat: The beak of this snake suggests that it is capable of burrowing into hard ground in the arid zones that it inhabits.

Bioregion: Bushmanland, Namaqualand Hardeveld, Upper Karoo.

Assessment rationale: Widespread and found in an area with relatively low-impact agricultural practices.



Conservation measures: Conduct surveys to discover the true range of the species.



Rhinotyphlops schinzi—Farm Botterkraal, about 37 km SW of Strydenburg, NC
M. Burger



Rhinotyphlops schinzi—Springbok, NC

J. Marais