Conservation status of the **reptiles** of South Africa, Eswatini and Lesotho

Edited by K.A. Tolley, W. Conradie, D.W. Pietersen, J. Weeber, M. Burger & G.J. Alexander

SURICATA 10

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Edited by
Krystal A. Tolley, Werner Conradie, Darren W. Pietersen,
Joshua Weeber, Marius Burger & Graham J. Alexander

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SURICATA

Suricata is the genus name of the suricate (*meerkat*), which is near-endemic to the arid western parts of southern Africa (occurring in Namibia, South Africa, Botswana; and just entering into a small area in the extreme south of Angola). Behaviourally, suricates are socially inclusive and innately inquisitive, symbolising the commitment of the South African National Biodiversity Institute (SANBI) to include all biodiversity and serve all of Africa, and the scientific curiosity that precedes and drives research and publication of research results. Sister journal to SANBI's *Strelitzia*, *Suricata* is a peer-reviewed journal and publishes original research such as monographs, revisions, checklists, Red Lists, Atlases and Faunas of any taxa belonging to Regnum Animalia (the Animal Kingdom).

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Foreword

Phil Bowles, Coordinator, IUCN SSC Snake and Lizard Red List Authority

The International Union for the Conservation of Nature's Red List of Threatened Species™ is designed to evaluate species' risk of extinction using the best available data at the time of assessment, but the increasing scale and severity of the biodiversity crisis makes this a fast-moving target.

An individual species might be subject to new threatening processes at any time, or to reductions in pressure (whether due to active conservation or otherwise). Changes in data quality and availability for a species or the land uses in the area where it occurs; the development or greater accessibility of modelling and analytical tools; and changes in our understanding of the taxonomy of a previously assessed species, all have the potential to substantially change our understanding of a species' risk of extinction, the threats driving declines in the species and its habitat, and vitally, the identity of priority species and the most appropriate interventions to ensure their survival.

A conservation assessment is only ever as good as the data at the time allow, and in species conservation, data are almost always partial. A species might be more widespread than previously believed – or less so – following taxonomic changes or recognition that past records were misidentified. Ecological data may reveal it to be either more or less tolerant of changes to its natural habitat than expected, or may change our understanding of its lifespan, reproductive output or age at maturity, all of which affect its susceptibility to threats. Previously unknown threats might be identified, or activities once expected to threaten a species found to have no impact.

If conservation management is informed by assessments that are outdated, the consequences for conservation can be severe: if a species that is not (or no longer) at significant risk is listed as threatened, vital resources, which could be better employed elsewhere might be devoted to conservation efforts for low-priority species. Conversely, if a species previously considered Least Concern is subjected to a novel threat capable of causing catastrophic declines in its global population or habitat – such as a new invasive species or damaging human activity, an emerging disease or climate change impacts – it risks being neglected in conservation planning.

In this volume, modern tools and the most current data available for nearly 400 reptile species have been used to produce the most accurate Red List assessments presently possible for this group of animals in South Africa, Lesotho and Eswatini. The methods employed here are rigorous in making best use of the datasets available to correct for biases in older conservation assessments, and so represent a substantial advance in understanding the conservation challenges facing these animals in the region. The editors estimate that the proportion of species threatened with extinction in this region, while low, has almost doubled since 1990. One South African lizard, *Scelotes inornatus*, has been in decline for at least the last 50 years, having been overlooked as a conservation priority, and the results of this work provide the opportunity for conservation planners to ensure that a similar fate does not befall any other species.

Hemachatus haemachatus (© A. Coetzer).

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(© L. Verburgt).

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The editorial process for this publication was lengthy and covered quality control regarding application of IUCN criteria and also significant vetting of original locality records for mapping. The editorial team met weekly, via Zoom, for a period of nearly two years to vet data, check identifications, adjust the assessments for new taxonomy and other new information, and ultimately to update the narrative for each species accordingly. The quality of the assessments, and of the maps in particular, are greatly improved from previous versions and the application of criteria should be more consistent across taxa. While we recognise that these assessments are something of a moving target in terms of new information, taxonomic changes, and in ensuring the criteria have been applied consistently, we sincerely hope that the information contained in this document will be useful for some years to come. We pass the baton to the next team from the new generation of herpetologists to carry forward and improve on our work in future assessments.

Abbreviations

AOO: Area of Occupancy
CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR: Critically Endangered
DD: Data Deficient
EN: Endangered
EOO: Extent of Occurrence
EX: Extinct
IUCN: International Union for Conservation of Nature
LC: Least Concern
NBA: National Biodiversity Assessment
NE: Not Evaluated
NT: Near Threatened
RLI: Red List Index
SARCA: Southern African Reptile Conservation Assessment
VU: Vulnerable

Aspidelaps lubricus
(© L. Verburgt).

1

South African Reptile assessments – past and present

Krystal A. Tolley & Graham J. Alexander

1.1 The IUCN Red List assessment process

One of the key functions of the International Union for Conservation of Nature (IUCN) is the oversight of conservation assessments of biological species. The primary purpose of this process is to assign a threat status (presented as risk of extinction) to individual species or other taxa (from here on referred to only as species). Assessed species are listed in an open-access web-based database – the proverbial 'Red List', (Red List of Threatened Species™; https://www.iucnredlist.org/) – which classifies species under a threat category or as not threatened (Figure 1.1): species with adequate data can be evaluated as threatened under the categories Critically Endangered (CR), Endangered (EN) or Vulnerable (VU), or as not threatened under Near Threatened (NT) or Least Concern (LC). Where there are insufficient data to conduct an assessment, species are classified as Data Deficient (DD). Species can also be classified as Extinct (EX) or Extinct in the Wild (EW). Species that have not undergone the assessment process are considered Not Evaluated (NE). Threat classifications are used in conservation planning and to prioritise conservation efforts and can also be analysed collectively to reveal trends in extinction risk over time and space. Thus, the IUCN conservation assessment process and the evaluation of extinction risk informs and guides most global conservation efforts.

The IUCN has defined five criteria (A–E) that can each be used independently to estimate the threat level for a species (Figure 1.1; Appendix 1). Each criterion is aimed at a different suite of measures to accommodate the assessment of the widest possible range of species and data types. Criterion A evaluates a species in terms of its population size and trends, typically over a period of three generations or ten years, whichever is longer. Criterion B assesses characteristics of the geographic range in conjunction with various measures of range decline and vulnerability. This criterion is the most used for reptiles because distribution datasets tend to be the most comprehensive biological information for reptile species. Criterion C is focused on small populations that show evidence of continued decline, while criterion D

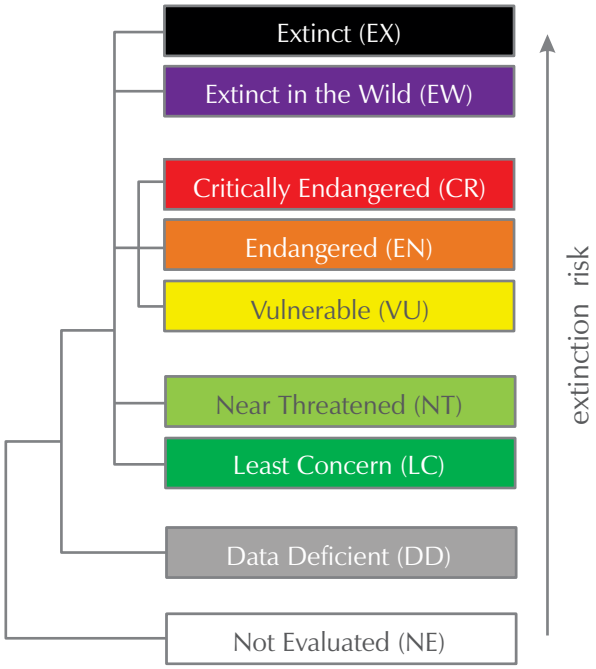


Figure 1.1. The levels of threat for species assessed through the IUCN process.

focuses on very small populations that are deemed to be threatened because the number of individuals is close to zero. Under criterion D, the criterion D2 allows for species with a very small range (usually defined by an AOO less than 20 km^2 or being at five or fewer locations) to be assessed as threatened, even if there is currently no threatening event. D2 applies to populations that are potentially prone to the effects of human activities or stochastic events that might drive them to Critically Endangered or Extinct in a very short period (i.e., within five years or two generations). However, D2 should only be applied if there is a likelihood of a relevant, plausible threat emerging in the near future. Criterion E is applied to species for which there is a great deal of quantitative data that allows for demographic modelling or other types of quantitative analysis. A species only needs to be scored as threatened under a single criterion to be classified as threatened, and the criterion that scores the highest threat level is taken as the threat category for the species.

Conservation assessments can be conducted at a regional ('regional assessment') or global ('global assessment') scale (IUCN 2012). Generally, global assessments are preferable because they assess species in their entirety but are not always feasible due to insufficient data from parts of species' ranges. In cases where species are endemic to a single country, an assessment for that country should be a global assessment by default. For regional assessments, the populations of species from only part of the distribution are assessed (typically covering the distribution in one or a few countries). National assessments may also be made for a single country to highlight local threats to national biodiversity, particularly if those species have not been assessed at a global scale. Regional and national assessments are typically not published by the IUCN. Given the superior greater utility of global assessments, every attempt should be made to conduct assessments at this scale.

Assessing regional populations can be more complicated than global assessments, depending on how populations and range boundaries of the assessed species relate to geopolitical boundaries. If the regional subpopulation is isolated from other subpopulations and occurs entirely within the boundaries of the assessed region, standard guidelines can be applied without modification (IUCN 2012). However, if only part of a subpopulation is assessed (i.e., it is cut by a geopolitical boundary) or if individuals from within the subpopulation move across the geopolitical boundary, threshold values used in the various criteria may be inappropriate, leading to inaccurate estimations of extinction risk. Such cases require adjustment, and estimations of extinction risk may be upgraded or downgraded depending on the characteristics of the assessed regional subpopulation and its relationship to other subpopulations of the species outside of the region. Guidelines for the procedure to make these adjustments are outlined by the IUCN (2012).

Spatial metrics of geographic distribution are used in several of the IUCN listing categories. Two of these, Extent of Occurrence (EOO) and Area of Occupancy (AOO) are central, especially to criterion B, but the meaning and use of these measures are often misunderstood and misinterpreted. EOO is a measure of the spatial spread of extinction risk – a species that is geographically widespread is more resilient to extinction because it is less likely that any given threat will impact all individuals in the population. EOO can be defined as the area of a minimum convex hull around all distribution records for the species (excluding vagrants) or around an interpreted representation of the species' distribution given expert knowledge of species habitats or probability of occurrence. Because the EOO is defined by a polygon around the distribution or point records, it can include areas that are known to be unsuitable or where the species does not occur. Importantly, EOO is not intended to represent the actual distribution of the species, but rather, is only a measure of spatial spread.

AOO is a measure of the area of suitable habitat where the species is known to occur. It is defined by the IUCN as the cumulative area of 2×2 km grid cells that intersect with locality records or suitable habitat (in cases where the species is clearly associated with a well-defined suite of habitats). Measures of AOO are inappropriate in instances where suitable habitat cannot be clearly distinguished from unsuitable habitat, where locality records are not precise, or where the dataset of locality records greatly underrepresents actual occurrence. Thus, AOO can generally only be used in the assessment of habitat specialist reptiles in southern Africa and historical misuse of this metric has resulted in several inappropriate estimates of AOO for South African reptiles in the past. Measures of AOO through time can also be used to infer changes in abundance and this metric may thus be relevant to criteria A, B, C and D.

The geographic distribution, or range of a species is the area where the species is known or thought to occur and is usually represented by one or more polygons on a distribution map. Because a distribution dataset consists of a set of point localities, a distribution map is an interpretation of the clusters of these points and the polygons drawn on the map are thus more realistically termed an 'interpreted distribution'. Traditionally, interpreted distributions were

constructed by drawing polygons around clusters of point localities and filling in areas where the taxon had not been recorded but was thought to occur, based on expert knowledge. However, recent advances in spatial modelling and niche modelling have resulted in the production of predictive models that report probabilities of occurrence over the possible distribution of the species. In cases where the interpreted distribution is thought to realistically represent the area where a species occurs, a convex hull drawn around all the polygons making up the interpreted distribution is a good measure of EOO.

The IUCN has specific definitions for certain terms that may differ somewhat from common usage. Three of the most frequently misunderstood terms are 'location', 'subpopulation' and 'severely fragmented'. In the context of an IUCN assessment, a location is the maximum area or part of the distribution of a species within which all individuals could be impacted by a credible threat in a single event, and that impact could be felt within three years or a single generation. For example, if a rapidly occurring pollution event could realistically decimate an aquatic species over an entire catchment, the catchment would be considered a single location. Secondly, a 'population' is considered to be made up of all individuals of a particular species. The population may be divided into a number of 'subpopulations' if there are distinct groups between which immigration and genetic exchange are limited. For example, a high-elevation lizard species that inhabits two mountaintops but not the lower areas in between these mountains would be considered as having one population but two subpopulations. Finally, the term 'severely fragmented' applies to a taxon when more than half the individuals making up the population occur in fragmented, isolated and non-viable subpopulations. These and other concepts should be followed when carrying out assessments (IUCN 2019) to maintain consistency and to establish credibility.

South Africa's Biodiversity Act (National Environmental Management: Biodiversity Act No. 10 of 2004) stipulates that South Africa's biodiversity must be monitored on a regular basis (approximately every five years). As part of this monitoring process, conservation assessments of species are revisited to evaluate if their risk of extinction has changed since the last assessment. It is the outcome of this process that is reported in this volume. However, there may be several reasons for a change in the threat status of a species: (1) more thorough research may result in a more realistic listing; (2) additional occurrence data may reveal new areas of occurrence; (3) the assessment process may be applied more rigorously; (4) taxonomic revisions may cause species to be assessed as a different concept resulting in a status change; and (5) the risk of extinction may have changed due to positive or negative impacts on the conservation of the species. Only the final reason (5) reflects a real change in the threat status of the species and is referred to as a 'genuine change' to the threat status. All changes due to a differing application of criteria, updated/new information, or of taxonomic changes are referred to as 'non-genuine' changes.

1.2 South African reptile Red Listing history

The first assessment of the conservation status for South African reptiles was published four decades ago and covered just 31 non-marine and three marine reptile species and subspecies (McLachlan 1978), which now make up less than 10% of the currently known species richness. At that time, approximately 30% of the assessed non-marine reptiles were considered to be threatened and 30% as 'Rare' (a category no longer used by the IUCN). Of the threatened species, one tortoise (*Psammobates geometricus*) was considered Endangered and the remainder of those assessed as Vulnerable. A follow-up assessment of reptiles a decade later (Branch 1988) included 72 non-marine reptile species and subspecies of which 15% were considered threatened. One species, *Tetradactylus eastwoodae*, was considered Extinct. Of the remaining threatened reptiles, *Psammobates geometricus* was again considered Endangered, as was the chameleon, *Bradypodion taeniabronchum*. Species considered to be Vulnerable were *Python (sebae) natalensis*, *Psammophis (leightoni) leightoni*, *Bitis schneideri*, *Bitis gabonica gabonica*, *Lygodactylus methueni*, *Cryptoblepharus africanus*, *Cordylus* (*Smaug*) *giganteus*, *Cordylus* (*Ouroborus*) *cataphractus* and *Crocodylus niloticus*. However, the protocol for applying IUCN categories and criteria have been revised and improved over the years, meaning that the assessments from different time periods are not entirely equivalent. Therefore, direct comparisons over these time periods have not been attempted, because this would not reveal real trends in the threat status of southern African reptiles through time.

The Southern African Regional Conservation Assessment (SARCA) was initiated in 2004 with the aim of producing up to date distribution information for 422 reptile species and subspecies (128 endemic or near-endemic species and subspecies) from South Africa, Lesotho and Eswatini (then Swaziland) and to facilitate the assessment of their threat status using the

latest IUCN categories. The project gathered together herpetological experts, enthusiasts and the general public to amass both historical and new distribution records for all reptiles in the region. This information was then used to complete the IUCN Red List assessment process for 405 species and subspecies from the region. Seventeen species were not assessed (one established alien and 16 with ranges peripheral to the region). SARCA culminated with the publication of *The Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland* (Bates et al. 2014), a volume that contains species accounts, photographs and distribution maps for all reptiles assessed from the region. The global assessments for the 128 endemic and near-endemic species were subsequently published by the IUCN in 2017.

The SARCA assessments concluded that 73 species were threatened or Near Threatened: five Critically Endangered (CR), ten Endangered (EN), 21 Vulnerable (VU) and 37 Near Threatened (NT). In addition, two species were considered Extinct (*Tetradactylus eastwoodae, Scelotes guentheri*) and six were regarded as Data Deficient. Overall, Testudines (tortoises, turtles and terrapins) were classified as the most threatened taxon, as measured by the proportion of threatened species. Among squamate reptiles, chameleons showed the largest proportion of threatened species. Similar to other regions globally (Böhm et al. 2013; Jenkins et al. 2014; Tolley et al. 2016), habitat loss, fragmentation and degradation, due to agriculture, afforestation and urbanisation, were considered the primary threats to reptiles in the study region (Branch 2014a). The CR status for four endemic (*Psammobates geometricus, Cryptactites peringueyi, Scelotes inornatus* and *Bitis albanica*) and one non-endemic (*Pachydactylus rangei*; regional assessment) species was attributed to habitat destruction across their small ranges. In particular, range reductions from habitat loss were considered severe for the Geometric Tortoise (*Psammobates geometricus*; 90% reduction) and the Durban Dwarf Burrowing Skink (*S. inornatus*; 80% range reduction).

As part of the National Biodiversity Assessment (NBA), the Red List assessments were updated for South African reptiles (http://speciesstatus.sanbi.org/) in 2018. The NBA is an evidence-based synthesis of the current state of biodiversity within South Africa that describes key pressures and important trends for biodiversity (Skowno et al. 2019). It is a tool for informing policy, planning and decision-making to promote the conservation and sustainable use of biodiversity in South Africa. The reptile reassessments were initiated in 2017 and published on the IUCN Red List in November 2018 (Tolley et al. 2019a). The process for reassessments differed from SARCA in several respects because the primary driver for reassessment was for national level reporting on species status. As such, all reassessments were carried out at the species level (i.e., no subspecies). However, many subspecies had been assessed under SARCA (instead of full species) leaving these taxa unassessed as full species, nationally. Therefore, for national reporting at the species level, which is required by the Convention on Biological Diversity, only full species assessments were conducted. In addition, the single reptile species endemic to Eswatini (*Afroedura major*), which was included in SARCA, was not reassessed. Also excluded were all marine species, which fell under a separate national assessment process (five turtles and one snake).

There are several important differences between the more recent assessments and the process used by the SARCA project (Bates et al. 2014). In SARCA, statistics and summaries regarding species of 'conservation concern' included those with a formal threat status, plus those classified as Near Threatened (NT) and Data Deficient (DD). This meant that 20% of South African reptiles were classified as being of conservation concern. However, in the current reassessments, a distinction is made between species classified as threatened under the IUCN categories (CR, EN, VU) and those considered NT and DD, in line with the current IUCN usage and statistical reporting. Thus, the statistics and summaries presented here regarding threatened taxa are not directly comparable to those presented in SARCA.

Another important distinction between this assessment and that of SARCA is that here, only threats for which there is plausible evidence are included. Because of this, some species have been downlisted with non-genuine changes. Unlike the process during SARCA, the 1990, 2013 and recent 2020 national land cover spatial datasets were interrogated for all species where habitat loss might be considered a threat, and these spatial layers were used to estimate the proportion of habitat loss as well as for assessing ongoing habitat loss. Another difference for the recent assessments was that for reptile trade to be considered a plausible threat, evidence was gleaned from the CITES Trade database statistics or online sources relating to non-CITES species and illegal trade (Figure 1.2). This more evidentiary approach has resulted in more realistic assessments of plausible threats.

Further differences between the recent assessments and SARCA relate to EOO, which had previously been estimated using the outermost edges of only the quarter degree grid squares (QDS) within which the species had been recorded. However, the EOO has now been estimated by using the interpreted

Figure 1.2. Trade in reptiles for the traditional medicine and pet markets can have a substantial impact on some species. Animal body parts for sale at the Faraday Traditional Market in Johannesburg are shown, including skins of python and monitor lizards (© V. Williams).

distribution to define a convex hull. In some cases, outlying records were not included in the interpreted distribution or EOO. Although such records could not be discounted (existing photograph or specimen), the record is markedly distant from any other record, and therefore the outlying locality requires further verification before inclusion within the distribution polygon. For the recent assessments, it was decided that the interpreted distributions would result in the most reliable EOO estimates because the number of records in databases are typically low per species (Tolley et al. 2016), potentially resulting in underestimates of range size (and EOO) using the QDS edges method. For example, the EOO increased for *Platysaurus monotropis* from 85 km^2 to 433 km^2 (changing the status from EN to NT) and for *Bitis albanica* from 95 km^2 to 699 km^2 (changing the status from CR to EN). In addition, the interpreted distributions also provide more realistic mapping of the geographic range, resulting in some range decreases. For example, estimates of EOO for *Goggia hewitti* decreased from 42 500 km^2 in 2014 to 25 000 km^2 in the current assessment.

Similarly, adherence to IUCN methodology for the estimation of AOO prevented that metric from being used to assign a threatened status for some species. During SARCA, the AOO was simply an estimate of the area within the EOO that was considered suitable for the species (e.g., transformed or other habitats excluded from the EOO). However, the correct use of AOO requires a comprehensive occurrence dataset allowing fine-resolution mapping, and such datasets are not available for most reptile species in the region, precluding the use of AOO. For instance, *Macrelaps microlepidotus* was listed as NT in 2014 due to habitat fragmentation and a 'small AOO' (2 305 km^2). However, the AOO cannot be estimated under the IUCN protocol as there are too many potentially qualifying 2 × 2 grids where the species may occur but has not been recorded, and there is uncertainty around the occurrence of the species in each natural forest patch. Thus, only EOO could be used, and for *M. microlepidotus* this has been estimated at 100 000 km^2, which is far in excess for qualifying for any threat category. Because EOO is a measure of extinction risk that depends on the overall extent of

where the species occurs, if the EOO is large, there is low risk that multiple events could impact the species and drive it to extinction. Thus, *M. microlepidotus* is now listed as LC. In the 2022 assessments, the AOO was estimated only for species for which locality records are sufficient enough to apply the IUCN protocol, or for species that are habitat specialists and occurrence can be confidently inferred. For example, fine-resolution interpreted distribution maps could be drawn for habitat specialists such as *Bradypodion caeruleogula*, *B. caffer*, *B. nemorale*, *B. ngomeense*, *Dendroaspis angusticeps*, *Hemicordylus nebulosus* and *Scelotes inornatus* by mapping the remaining habitat using a combination of vegetation and land cover base maps. This allowed those species to be assessed based on AOO as well as EOO.

The 'number of locations' and the 'severely fragmented' criteria were often invoked for the SARCA assessments and resulted in many species qualifying for a threatened category. For the current assessments, the IUCN definitions (IUCN Standards and Petitions Subcommittee 2019) for these two criteria were carefully applied and this resulted in fewer species qualifying for a threatened status (Appendix 2). For example, in 2014 *Bradypodion pumilum* was considered severely fragmented by urbanisation (Tolley 2014). For the later reassessments, the spatial extent of the geographic distribution was quantified, and the larger portion of the distribution is not in urban areas. Thus, it was concluded that more than half the population does not occur as small, isolated subpopulations and 'severely fragmented' does not apply in this instance. There were also several species considered to be at fewer than ten locations for the 2014 assessments, but the active threats and associated spatial description of the threats were not specified. For example, *Afroedura hawequensis* was assessed as Near Threatened due to being at fewer than five locations. Nevertheless, there was no appraisal of which plausible threats would equate to each location, i.e., whereby a single threat event could affect all individuals at that location in just three years or one generation (IUCN 2019). Thus, the status of *A. hawequensis* has changed from NT to LC. These status changes are considered 'non-genuine' because the plausible threats to the species have neither intensified nor been ameliorated, but the process for assessment of the risk from those threats has changed.

In summary, the most recent assessments include some important changes as a result of new mapping, knowledge and taxonomy, and in terms of adherence to the IUCN guidelines as well as consistency in application of criteria. For some species, this resulted in a different threat category than previously. The global assessments have been published by the IUCN (https://www.iucnredlist.org/), and both the global and regional assessments are available from the South African National Biodiversity Institute (http://www.sanbi.org/).

1.3 Summary of findings in 2022 assessments

This current volume is the culmination of additional work that followed the 2018 publication of the reptile assessments. As of January 2022, there are 410 species of reptiles recorded as indigenous or introduced/naturalised in South Africa, Eswatini and Lesotho (Appendix 2), including ten peripheral species (six marine and four terrestrial), one introduced, naturalised snake and two extinct lizards. All but two occur wholly or partly in South Africa, with Eswatini having the only two reptiles (*Afroedura major* and *Leptotyphlops telloi*) that have not been recorded from South Africa. Therefore, South Africa alone has 401 indigenous terrestrial reptiles of which two are considered extinct. There are 120 species recorded from Eswatini and 51 from Lesotho (all but two of these are shared with South Africa). It should be noted that since Bates et al. (2014), seven species have been removed from the South African species list. Five of these are no longer considered valid (*Acontias poecilus*, *Cordylus aridus*, *Cordylus cloetei*, *Psammophis namibensis* and *Psammophis trinasalis*), and two had been erroneously recorded as occurring in South Africa (*Natriciteres olivacea*, *Xenocalamus sabiensis*). The Red-eared Slider (*Trachemys scripta*) from North America has been recorded in South Africa but is not included on the species list given that it is not considered naturalised (i.e., reproductive populations are not maintained without human assistance).

Two South African reptile species are considered Extinct (*Tetradactylus eastwoodae*, *Scelotes guentheri*), and three Critically Endangered (*Psammobates geometricus*, *Scelotes inornatus, Cryptoblepharus africanus*). All but one of these species are endemic to South Africa, and it is notable that while *P. geometricus* was previously considered Endangered, neither *S. guentheri* nor *S. inornatus* were included in early sets of assessments (1978 or 1988). Both these fossorial skinks occur in eastern KwaZulu-Natal province, where habitat loss has been substantial (see Skowno et al. 2019). While *S. guentheri* likely has been extinct for decades, *S. inornatus* probably has been in decline since the early conservation assessments by McLachlan (1978)

and Branch (1988) but was overlooked as needing attention. Ten endemic reptiles (three chameleons, two tortoises, two skinks, one gecko and one viper) are considered Endangered at present (Appendix 2) but few of these species were flagged as threatened in 1978 or 1988 (only *Lygodactylus methueni* as VU). Two species, however, *Bradypodion thamnobates* and *Homopus signatus*, were regarded as taxa that might be threatened in the future (Branch 1988) and this prediction has borne out. Finally, the region has 17 Vulnerable reptile species, of which ten are endemic or near-endemic, four are non-endemic and three are peripheral (Table 1.1 A & B; Appendix 2).

With several species having been moved from LC to a threat category without first being flagged as NT, despite earlier assessments of South African reptiles, this shows that emerging threats that would trigger an NT category cannot always be anticipated. Furthermore, some threats might become quickly active, pushing species to threatened categories without first being flagged under NT. For example, threats due to predation by corvids have increased dramatically over the past three decades, particularly in the southwestern and southern regions of South Africa where corvids have become significantly more abundant (Cunningham et al. 2016; Figure 1.3). Trade in reptiles could be another emerging or rapidly increasing threat that could have a significant effect on some species. Conversely, *Psammobates geometricus* has been highlighted in each set of assessments since 1978 as being in decline, yet its threat status has worsened from Endangered to Critically Endangered. That is, conservation measures to stem extinction risk for this species have not been successful despite it being categorised as at risk for more than 40 years.

Figure 1.3. Predation on tortoises by corvids could be a threat in some areas. These tortoise shells were found under the nest of a Pied Crow (*Corvus albus*) in the Karoo (© M. Martin).

Including peripheral species in the analysis, 7.6% of the region's reptile species are at risk of extinction, with an additional 5.6% considered Near Threatened (Figure 1.4). The majority of threatened species are endemics or near-endemics (Table 1.1 A) and most of the threatened or Near Threatened species are lizards (Figure 1.5; Table 1.1 B). The percentage of threatened reptile species in the region shows a considerably lower estimate of extinction risk than in previous assessments (30% – McLachlan [1978]; 15% – Branch [1988]; 10% – Bates et al. [2014]), which is particularly remarkable given that habitat loss, as well as other threats, are presumed to have increased. However, McLachlan (1978) and Branch (1988) focussed on taxa that were specifically targeted for evaluation because of a perception that they were threatened. These early sets of assessments are therefore inherently biased toward higher percentages of threatened taxa. The current assessments, as well those of Bates et al. (2014), were comprehensive faunal assessments and should therefore provide a less biased view of the conservation status for reptiles regionally. Nevertheless, there is a lower proportion of threatened reptiles at present than in 2014 due to many non-genuine changes, where improved information, knowledge of criteria and careful application of the IUCN criteria resulted in several status downgrades. Furthermore, the current assessments relied on the use of spatial information from national land cover layers for 1990, 2013 and 2018. This allowed for a comparison of the natural and non-natural land cover over several decades to verify habitat loss and fragmentation. For some species, the original assessments cited substantial habitat losses, but the actual land cover data did not support this. Another factor contributing to the lower proportion of threatened species is due to the numerous subspecies that were assessed as threatened during SARCA, whereas the current assessments considered only full species, which tend to be more widespread and therefore

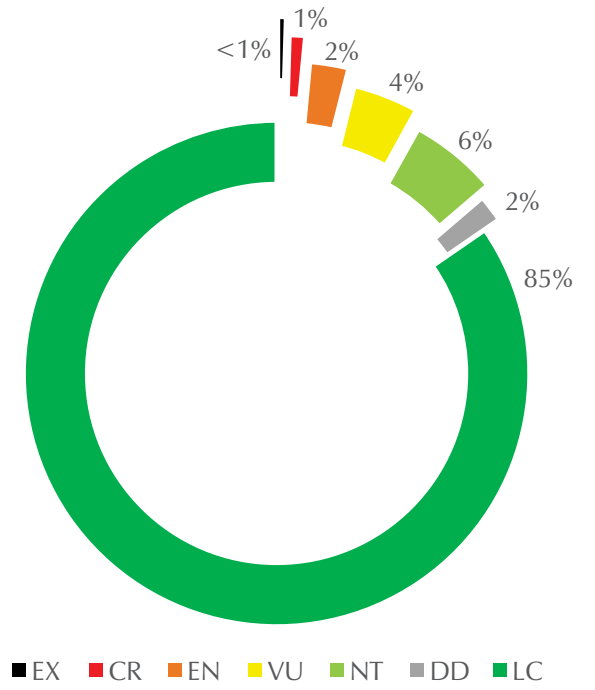


Figure 1.4. Summary of findings for the proportion of reptile species in each IUCN category. EX – Extinct; CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; DD – Data Deficient; LC – Least Concern.

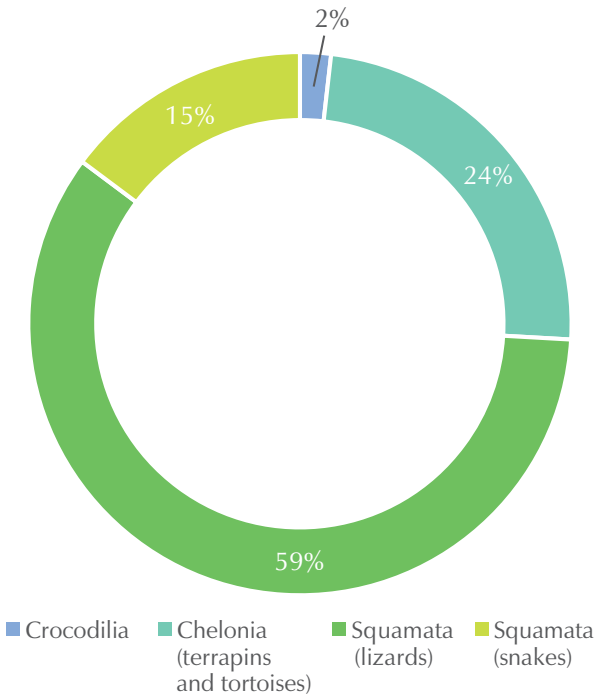


Figure 1.5. Threatened and Near Threatened species per taxonomic order of reptiles as a proportion of the total number of reptiles in the region.

Table 1.1A. Number of species in each IUCN category for reptiles from South Africa and from the region (South Africa, Eswatini and Lesotho) for the types (endemic/near-endemics, non-endemic, peripheral, introduced) with proportion of threatened (CR, EN, VU) and Near Threatened (NT) species for each specific type and as the proportion of all species. These summary figures include the six marine (five turtles, one snake) and one naturalised snake species that occur in the region

	Categories								Threatened			Threatened & Near Threatened		
Type	EX	CR	EN	VU	NT	DD	LC	Total	#spp	% type	% total	#	% type	% total
Endemic/near-endemic	2	2	9	10	21	6	169	219	21	9.5	5.1	42	19.1	10.2
Non-endemic	0	1	0	4	2	0	174	181	5	2.7	1.2	7	3.9	1.7
Peripheral	0	1	1	3	0	1	2	8	5	62.5	1.2	5	62.5	1.2
Introduced	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Total #spp.	2	4	10	17	23	7	347	410	31	7.6	7.6	54	13.2	13.2
% per category	0.5	1.0	2.4	4.1	5.6	1.7	68.0							

Table 1.1B. Number of species in each IUCN category for each reptile group from the region (South Africa, Eswatini and Lesotho) with proportion of threatened (CR, EN, VU) and Near Threatened (NT) species for each specific type and as the proportion of all species combined. These summary figures include the six marine (five turtles, one snake) and one naturalised snake species that occur in the region

	Categories								Threatened			Threatened & Near Threatened		
Type	**EX**	**CR**	**EN**	**VU**	**NT**	**DD**	**LC**	**Total**	**#spp**	**% type**	**% total**	**#spp**	**% type**	**% total**
Crocodilia	0	0	0	1	0	0	0	1	1	100.0	0.2	1	100.0	0.2
Testudines	0	2	3	7	1	0	11	24	12	50.0	2.9	13	54.2	3.2
Squamata – lizards	2	2	6	7	17	6	230	270	15	5.6	3.7	32	11.9	7.8
Squamata – snakes	0	0	1	2	5	1	106	115	3	2.6	0.7	8	7.0	2.0
Total #spp.	2	4	10	17	23	7	347	410	31	7.6	7.56	54	13.2	13.2
% per category	0.5	1.0	2.4	4.1	5.6	1.7	68.0							

under lower threat. The result is that many of the full species have been assessed at a lower threat status than their constituent subspecies had been in 2014.

Through a random subsample of all reptiles, it was estimated 15% of reptiles are threatened globally (Böhm et al. 2013). Thus, reptiles from the region superficially appear to be faring well with only 7.6% threatened (~13% when including the Near Threatened category). However, because many of the 2014 assessments were downgraded due to improved information, knowledge of criteria, and stricter application of criteria, this raises questions regarding consistency and repeatability of the IUCN assessment process. For example, the lower proportion threatened taxa in the current assessments as compared to both earlier assessments (Bates et al. 2014) as well as the global average (Böhm et al. 2013) may be due to assessor bias (Hayward et al. 2015; Vignoli et al. 2017). Because the application of IUCN guidelines was more meticulous for the current assessments, this could reflect the non-aligned interpretations of criteria both locally and globally, rather than a genuine disparity in extinction risk. Assessor bias could be slanted toward precautionary assessments or reluctance to downlist species, or possibly because of inexperience and/or specific agendas (Hayward et al. 2015). That the current assessments show a lower overall threat status in comparison to those from 2014 and most of the changes have been non-genuine allude to some form of assessor bias contributing to higher threat proportion in the earlier assessments.

1.4 Backcasting and Red List Index

The Red List Index (RLI), which is a measure of the extinction risk for an entire group of species, was first estimated for South African reptiles to assess changes in extinction risk for the group over time (see Tolley et al. 2019a). While the 2018 assessments were available for the RLI estimation, an additional set of assessments was needed at a previous time point to track changes in the RLI. Unfortunately, the assessments by Bates et al. (2014), as well as the historical assessments (McLachlan 1978; Branch 1988) were inappropriate comparisons due to inconsistencies in categories, criteria, assessment of subspecies instead of full species, assessment methods and philosophical approaches. Therefore, 'backcasting' was used to assess species status by applying recent IUCN standards (IUCN 2013) at a time point of 1990. Given that habitat loss was the primary threat to reptiles, Geographic Information System

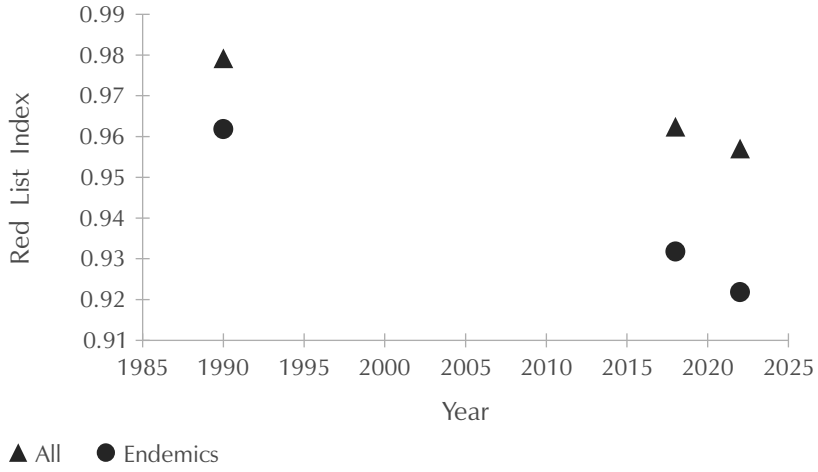


Figure 1.6. The Red List Index (RLI) has decreased for South African reptiles between 1990 and 2022. This is especially evident for endemic species.

(GIS) was used to intersect each species' interpreted distribution with a map layer denoting all-natural areas in 1990 derived from the South African national land cover layer 1990 (NLC 1990). This allowed for examination of the EOO, AOO, habitat fragmentation and locations at the 1990 time point. The severity of threats was then postulated, and a threat category was assigned for each species as of 1990. In addition to the backcasted 1990 data and the assessments from 2018, a third time point using the current (2022) assessments was added to establish a longer-term trend for the RLI (Figure 1.6).

For reptiles from the region, the RLI has decreased over time, with a stronger decrease for endemic and near-endemic species than for all species combined, showing that the local species are faring worse (Tolley et al. 2019a; Figure 1.6). Habitat loss was identified as the primary factor driving risk at both time points. The national land cover maps for South Africa (1990 and 2013) show that most of the habitat degradation and fragmentation was historical (pre-1990), and that habitat loss has been more intense in some areas of the country particularly near urban centres (Figures 1.7 & 1.8). Overall, 18.2% of the landscape is fragmented or degraded, but most of this loss occurred prior to 1990 (Figure 1.7). Between 1990 and present there has been relatively little additional conversion of natural land cover (2.3% loss compared to the overall sum of 18.2% loss since historical times) and the rate of land cover change has lessened in the last few decades, which may suggest that the steep drop in RLI between 1990 and present may be slowed in the future. Nevertheless, the increase in the proportion of threatened species from 1990 (2.5%) to 2022 (7.6%) has been notable (Table 1.2; see also Tolley et al. 2019a).

Table 1.2. Comparison of IUCN category for each reptile group from the region (South Africa, Eswatini and Lesotho) for 1990 (backcasting), 2018 and 2022 status. Marine, peripheral and introduced species are only given in parentheses in the 2022 column, as they were not included in backcasting. Change in status is given as the percent increase or decrease (negative values) of the number of species in a category (comparison between 1990 and 2022)

Status	1990	2018	2022	% change
EX	2	2	2 (0)	0
CR	1	2	2 (2)	100
EN	5	6	9 (1)	80
VU	4	12	14 (3)	250
NT	10	14	23 (0)	130
DD	9	13	6 (1)	-33
LC	370	337	344 (3)	-7

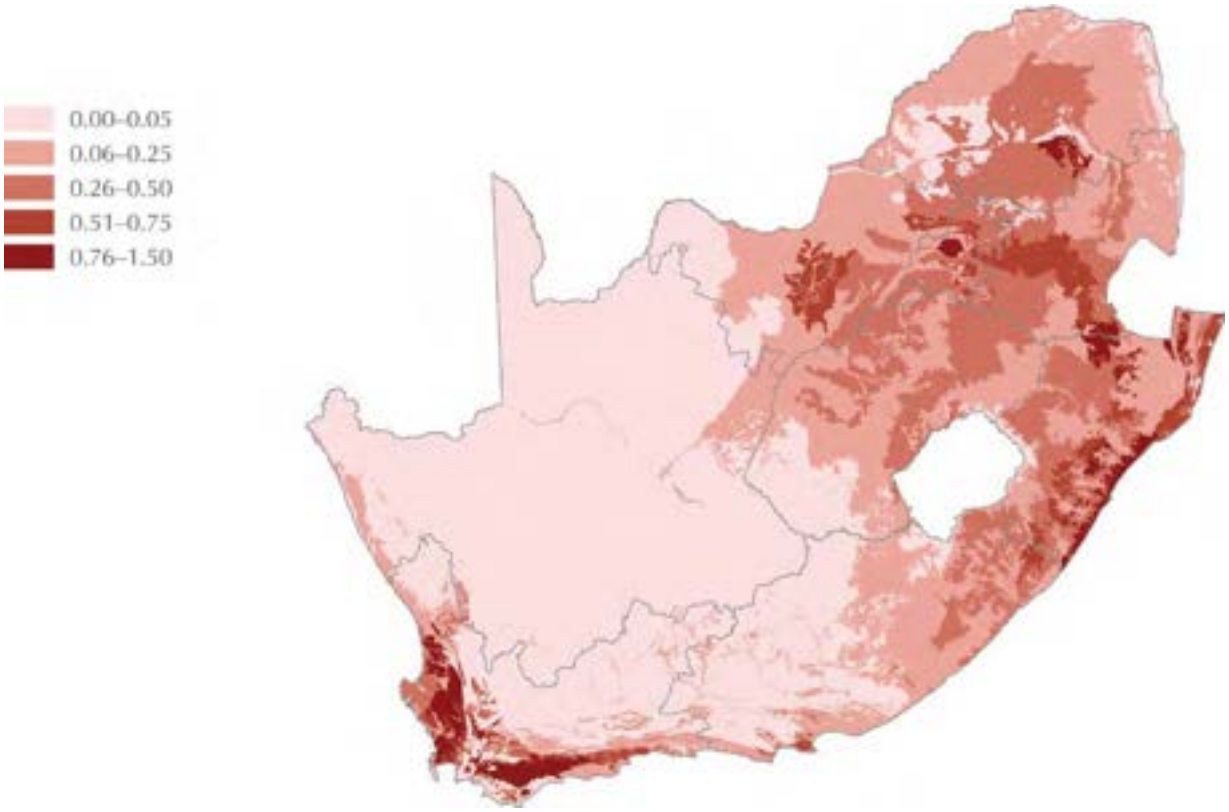


Figure 1.7. Rates of habitat loss within South Africa between 1990 and 2018 (reproduced from Skowno et al. 2019). Spatial data were not available for Eswatini and Lesotho.

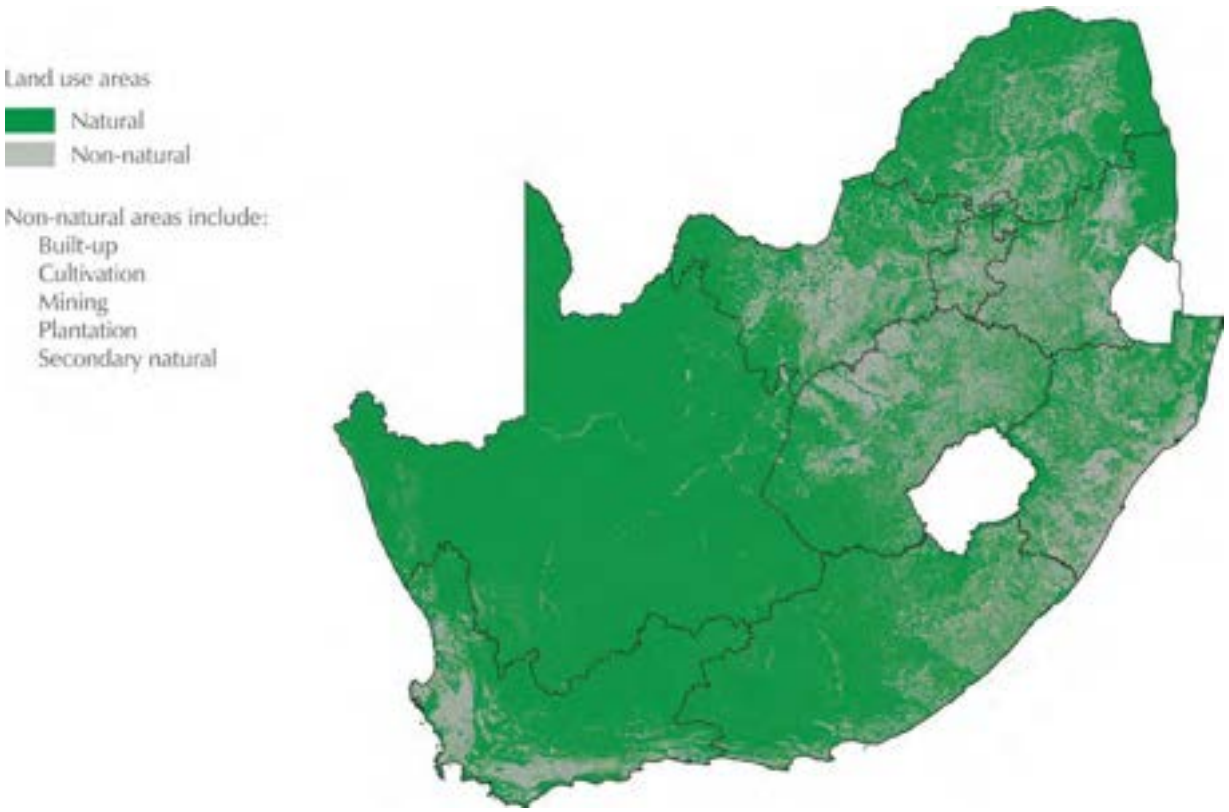


Figure 1.8. National land cover showing natural (green) and non-natural areas that have undergone habitat transformation (grey). Spatial data were not available for Eswatini and Lesotho.

1.5 Species richness and extinction risk

Using the interpreted distributions created for the 2022 assessments, species richness for reptiles was mapped on a 10 × 10 km resolution, by overlaying the interpreted distributions of all species and extracting the number of species in each grid. This information was then used to create a species richness heat map (Figure 1.9A). Richness for the reptiles as a whole is highest in the northeastern parts, which is not surprising given that this area is subtropical and is the contact zone of different biogeographic groups, where tropical species assemblages to the north converge with temperate species assemblages from the south (Alexander 2004; Linder et al. 2012). In contrast, richness of endemics and near-endemics is highest in the southern and western parts of the region. This is partially due to species that are centred far from political boundaries being less likely to extend beyond the boundaries, but also appears to be related to the topographically complex parts of the region.

The richness of all threatened and Near Threatened species (species of conservation concern) was then mapped using the same method (Figure 1.10A), as well as for endemics and near-endemic species of conservation concern (Figure 1.10B). For all species and for the endemics and near-endemic species, the occurrence of threatened and Near Threatened species is mainly within the northeastern and southwestern parts of the region, with few threatened species occurring in the central, northwestern or southeastern parts. Maputaland in northeast KwaZulu-Natal province stands out as the node of highest species richness with a second node in the Wolkberg/Woodbush region of Limpopo province, and a third in the Elands Bay/Lambert's Bay region of the

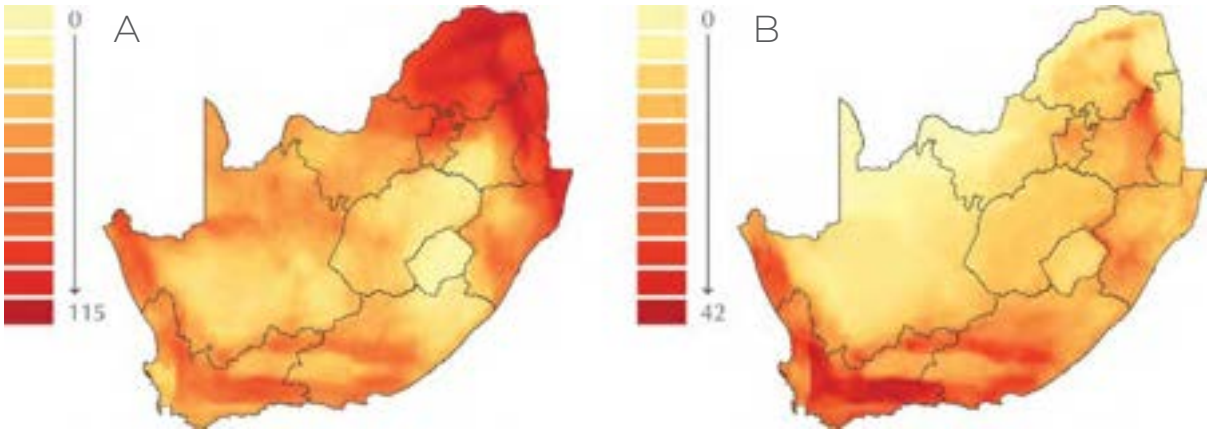


Figure 1.9. Species richness of A, all reptiles in the region; and B, endemics and near-endemics to the region. Warmer colours in the colour ramp indicate higher densities.

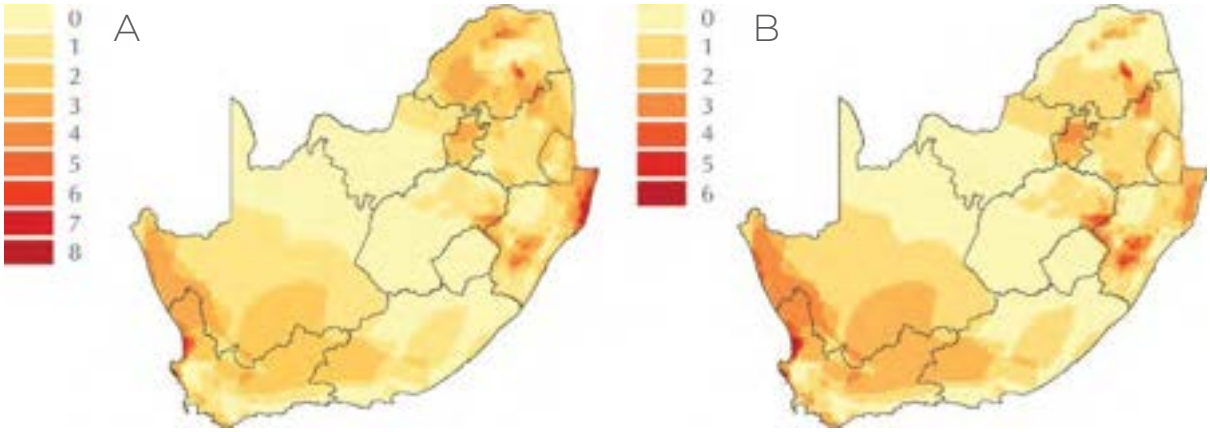


Figure 1.10. Richness of reptile species that are of conservation concern (Critically Endangered, Endangered, Vulnerable and Near Threatened) for A, all reptile species in the region; and B, species endemic and near-endemic to the region. Warmer colours in the colour ramp indicate higher species density.

southwestern Cape. In many instances, threatened and Near Threatened species appear to be associated with topographic features such as mountainous areas, but this is not always the case (e.g., Maputaland). Areas of high species richness of reptile species at risk have a need for stronger conservation measures and should be areas of conservation priority for reptiles.

1.6 Concluding remarks

While a smaller proportion of South Africa's reptiles appear to be at risk of extinction than compared to reptiles globally, it is not possible to tease apart the factors that contributed to these differences. Therefore, the focus should rather be on assessing if the country's reptiles are faring well from a conservation perspective. Indeed, half of the threatened species in South Africa are well protected in conservation areas, and the two threatened species do not occur in any conservation area at all (Tolley et al. 2019a). Some of the most threatened species occur in proximity to coastal metropolitan centres (e.g., *Scelotes inornatus*, *Bitis albanica, B. armata*, *Dendroaspis angusticeps*), where there has been disproportionately high pressure for land conversion (see Figures 1.7 & 1.8). Two species of South African reptiles (*Scelotes guentheri* and *Tetradactylus eastwoodae*) are considered Extinct, and notably, these are two of only four documented continental reptile extinctions globally, with all other extinct reptiles previously occurring only on islands. Habitat loss has been implicated in both of the South African extinctions. Given these statistics, South Africa's reptiles may not be faring as well as indicated by the overall proportion of threatened species and the declining Red List Index. Interrogation of additional metrics support the notion that many South African reptiles are at a critical point, and that disruption of metapopulation processes is leading to a heightening of extinction risk into the future. Repeated assessments and tracking of the Red List Index are thus needed to evaluate these trends, but the implementation of the recommended targeted research and conservation measures included in each assessment is needed to forestall extinction for many of these species.

Afroedura hawequensis (© C. Hundermark).

2

South African reptile Red List assessments – processes and procedures

Krystal A. Tolley, Graham J. Alexander, Werner Conradie, Darren W. Pietersen & Joshua Weeber

In this publication, the Red List assessments for reptiles that occur in South Africa, Eswatini and Lesotho are presented in detail, and summary tables of findings are provided in Appendix 2. These assessments are current as of November 2022, with changes in data, taxonomy or other information not included after that time. Excluded from the reassessment process were the six marine reptile species as these species have been assessed through other initiatives. Also excluded was one introduced, naturalised species (*Indotyphlops braminus*), which is Least Concern globally and was not considered in need of a separate regional assessment. However, the species that were not assessed here are included in the summary lists and tables for completeness, and the global status of each is also provided (Appendix 2).

Together, the countries of South Africa, Eswatini and Lesotho are referred to as the 'region'. For species that are endemic or near-endemic to the region, global IUCN Red List assessments were carried out. For non-endemic species, regional IUCN Red List assessments were carried out to review the status of species for the proportion of the species ranges in the region. These are the first regional assessment updates since Bates et al. (2014). For two peripheral species, (*Nucras caesicaudata* and *Gerrhosaurus auritus*), the global status was considered the most appropriate measure of their threat status and separate regional assessments were not carried out.

These updated assessments have been standardised in terms of information provided, and outstanding issues of clarity have been reconciled where possible. An important distinction between these current assessments and earlier versions is that the underlying mapping data have been extensively interrogated for accuracy, and a significant number of new records have been added. The original dataset used in Bates et al. (2014) and the 2018 IUCN versions relied on a dataset compiled in 2009, but many new records have since been collected. Furthermore, the 2009 dataset had a high error rate with many duplicate records, and this affected the interpretation of distributions and conservation assessments. While the new dataset is certainly not error free, the confidence in the interpretation of distributions has been improved due to the intensive data cleaning.

Another change is that two species previously listed as occurring peripherally in South Africa (Bates et al. 2014) have been removed from the country's list. *Natriciteres olivacea* was considered to occur peripherally in South Africa based on two specimens from northern KwaZulu-Natal province. However, examination of the voucher specimens revealed that it had been misidentified and that it is actually *N. sylvatica*. The single record of *Xenocalamus sabiensis* was thought to have been collected in Pafuri in Limpopo province (Bates et al. 2014). However, an inspection of the original field notes for the specimen indicates the collection locality was not in South Africa, but from '6 km north of Pafuri', i.e., in Zimbabwe.

2.1 Assessment content

2.1.1 Types of assessments

Global assessments: In these assessments, the threat status for species endemic or near-endemic to the overall region of South Africa, Eswatini and/or Lesotho were reviewed. Endemic species have their entire geographic distribution within the region, whereas

near-endemics were defined as having at least 90% of their distribution within the region.

Regional assessments: These assessments cover species with 10–90% of their distribution in South Africa, Eswatini and/or Lesotho. Many of these species are widespread across sub-Saharan Africa. Although their global assessments covering their entire range are available on the IUCN website, regional assessments were conducted to evaluate local threats and conservation issues within the boundaries of South Africa, Eswatini and Lesotho. For these species, potential movement of individuals between regions could influence the risk of extinction within the regional subpopulation. We therefore followed IUCN regional assessment guidelines, taking into account the influence of either immigration or isolation on the regional subpopulation when carrying out the assessment (IUCN 2012). In cases where the regional population is influenced by immigration from outside, the regional category was downlisted according to the protocols set by IUCN (2012).

Peripheral species: These were defined as species with less than 10% of their distribution in the region. Separate regional assessments were not carried out for peripheral species given that most of the threats and related conservation measures would mostly be relevant outside of the region. However, for completeness, the published IUCN global assessments of the peripheral species have been included, although the range maps show only the regional distribution. There were two exceptions to this. Firstly, some species that are widespread in the region but with the vast portion of the range outside the region, would fall well under the 10% cut-off criterion (e.g., *Bitis arietans*). For these species, if the range size in the region exceeded 10 000 km^2, they were not considered peripheral, even if more than 90% of the range is outside of the region. Secondly, *Cryptoblepharus africanus* and *Pachydactylus rangei* both would qualify as peripheral under the above definition (both have <1% of the range in the region), but full regional assessments were carried out. *Cryptoblepharus africanus* consists of an isolated subpopulation in northern KwaZulu-Natal province, with the nearest known subpopulation 500 km to the north in Mozambique. Given the uniqueness of this small subpopulation, it was considered important in terms of conservation, so a regional assessment was carried out. For *Pachydactylus rangei*, a regional assessment was conducted because this gecko was assessed as Critically Endangered in Bates et al. (2014) due to a population decline from habitat loss. However, inspection of the latest national landcover layer suggests there has been little habitat loss in the area. In addition, the assessment presented in Bates et al. (2014) was not carried out according to the IUCN guidelines for regional assessments and would require down-weighting due to immigration from the larger portion of the range in Namibia. These factors made it necessary to publish a new, corrected re-evaluation.

Marine species: There are several marine reptiles (five marine turtles and one species of sea snake) that occur in South African waters, although all are peripheral to the region. Because the marine realm has very different pressures to the terrestrial realm, and marine species have different ecologies and life histories, marine species assessments are carried out through a separate initiative. These species are, however, included in the list of species for the region (Appendix 2).

2.1.2 Assessment changes over time

Some of the species covered in this review have previously been assessed, and their histories of IUCN categories are listed within each assessment. The assessment history for some is notably variable with several shifts in threat status, usually due to non-genuine changes, where taxonomic changes or new information resulted in a different assessment category. This contrasts with genuine changes, where the category has truly changed due to either increased threat (an increase in category) or to an amelioration of threat and possibly conservation interventions that have resulted in reduced threat and subsequent recovery of the species (a decrease in category).

All subspecies assessed by Bates et al. (2014) have now been assessed at the species level. The rationale for this new approach is that subspecies are not the usual units of IUCN assessments, nor of conservation and management. By assessing subspecies (Bates et al. 2014), the full species were left without an assessment and could not be used for tracking species-level trends for South Africa (e.g., Skowno et al. 2019) or for reporting national trends that are required under the Convention on Biological Diversity. Therefore, it was imperative to shift the previous convention of assessing subspecies to ensure that all full species were assessed. For these species, the history of the subspecies previously assessed are given under each species assessment.

2.1.3 Datasets and distribution maps

Distribution maps have been updated from those presented in Bates et al. (2014) by adding new data

from museums and additional data sources, as well as cleaning errors included in previous maps. The maps in Bates et al. (2014) were created based on a comprehensive dataset from many sources, but only included data collected up to 2009. The new dataset is current as of 1 April 2020 and includes ReptileMap (https://vmus.adu.org.za) and iNaturalist (https://www.inaturalist.org/) records in addition to the previous dataset and new records from selected museums. The original dataset compiled by Bates et al. (2014) contained over 135 000 records, however, the removal of many duplicate records (± 24 000 records) resulted in a reduction of the original dataset. Specifically, many museum specimens were duplicated in the dataset as georeferenced literature records or were duplicated from provincial databases. Unfortunately, the full extent of duplication remains unknown, but is estimated to be in excess of 30% of the entire dataset used by Bates et al. (2014). Although known duplicates have been removed, with the addition of new data, the dataset now includes approximately 148 000 records (Figure 2.1). It should be noted, however, that some duplicated records remain, and further work is needed to identify and remove them.

For the mapping process, the existing point locality data and the original drafts of the interpreted distribution maps created for the 2018 assessments were first overlaid using GIS software. This combination of spatial information was inspected for outlying datapoints, and the original data for each of these outlying points interrogated and tracked. In some cases, the locality data were found to be in error (e.g., the latitude/longitude did not match the locality description) and in these instances, the coordinates were georeferenced using GeoLocate (https://www.geo-locate.org/), GoogleEarth and/or the national cadastral GIS map layer. In other cases, species identifications were incorrect, or the taxonomy required updating. More than 1 000 records have been corrected or excluded due to detection of errors.

For the final maps (Figure 2.2), the cleaned dataset was used to guide the drawing of interpreted distributions. Areas where the species would be expected to occur with high confidence were included in the interpreted distribution polygon even if it had not yet been recorded there. Quarter degree grid cells where each species has been recorded are shaded to visualise where in the distribution polygon that species has been recorded. Many of the species also have outlying records that could not be discounted (e.g., museum specimens with detailed, potentially credible locality information), and these are recorded

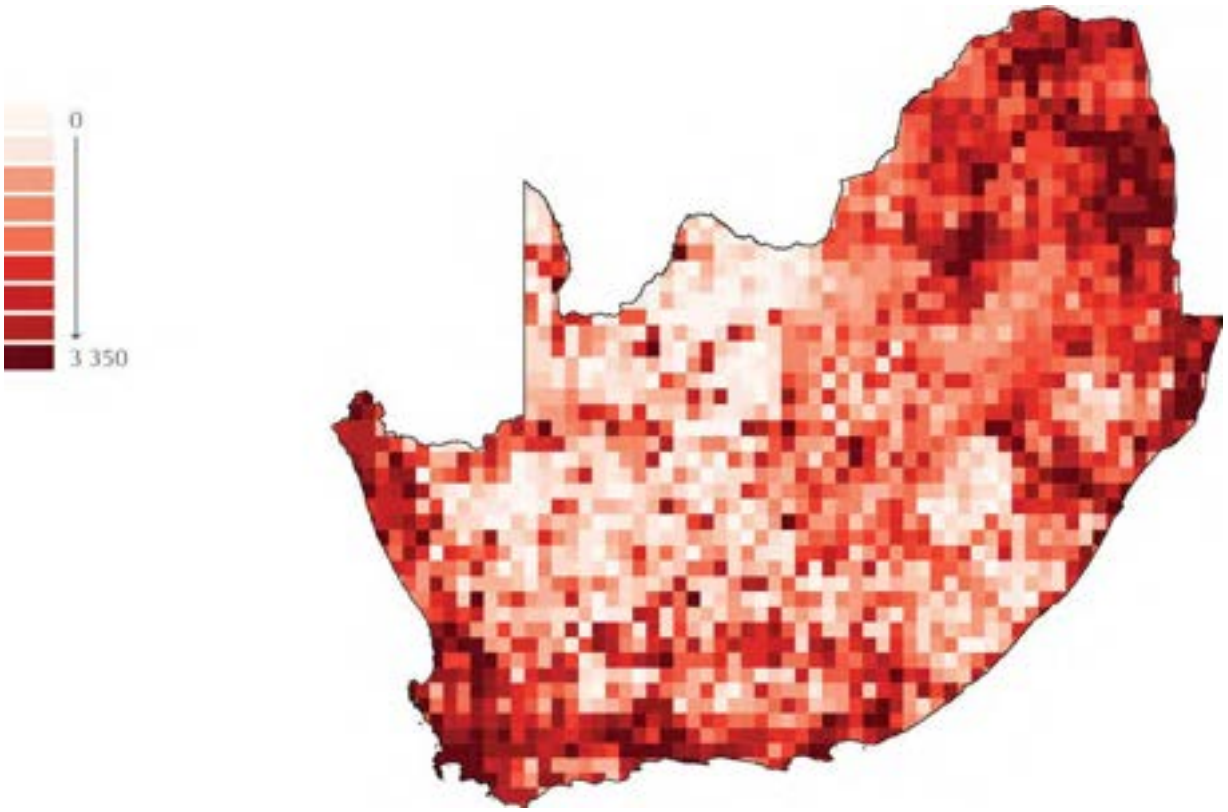


Figure 2.1. Density of records per grid cell that were available for mapping, excluding literature records and records found to be erroneous. Record density ranged from 0 to 3 100 per grid cell, and the warmer colours in the colour ramp show higher densities.

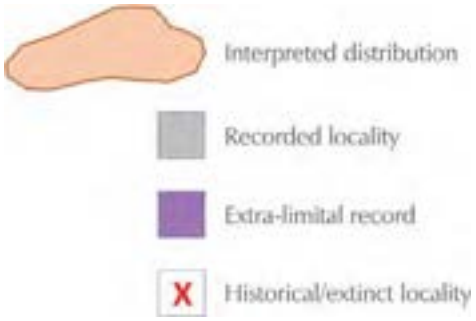


Figure 2.2. Key to map symbology.

as individual quarter degree cells outside the distribution polygon. For these species, the outlying grid cells were not included in the estimation of EOO unless specifically stated in the distribution section of the species account. Grid cells showing subpopulations that have become locally extinct are indicated with an 'X' on the distribution maps. Finally, extra-limital records (e.g., invasive or accidentally introduced populations) are shown by purple shaded grid cells, but these records are not included in the estimate of EOO.

2.1.4 Assessment sections

(1) Taxonomic notes

As per IUCN standards, this section covers outstanding matters or confusing issues that might result in taxonomic uncertainty with regards to the species being assessed. These notes sometimes include a discussion of where misidentifications could be misleading when either carrying out assessments, interpreting range maps or identifying specimens. A detailed taxonomic history is not provided, and historical taxonomic changes are not listed if the change has become common knowledge. Some other important taxon names that were used in older literature are sometimes listed to provide clarity, such as names that relate to a taxonomic change or those that were still in use at the time of Branch (1998). For a full list of synonyms and taxonomic history, the Reptile Database (http://www.reptile-database.org/) should be consulted.

The taxonomic backbone used in this publication follows that of the IUCN, informed by recent updates made by Zaher et al. (2019). While this scheme is reasonably stable, there are a few groups with notable recent changes, some of which are not yet universally accepted. In particular, the taxonomy of the Lamprophiidae has been in flux, with several subfamilies having been described, some of which are sometimes treated as distinct families. In addition, the placement of certain genera within these (sub) families has also changed over time. In this volume, the family Lamprophiidae includes the genera *Boaedon*, *Gracililima*, *Inyoka*, *Lamprophis*, *Limaformosa*, *Lycodonomorphus* and *Lycophidion*, as well as *Montaspis* (Zaher et al. 2019). Following Zaher et al. (2019), separate families are used for the former subfamilies of Lamprophiidae, Atractaspididae (genera *Amblyodipsas, Aparallactus*, *Atractaspis*, *Homoroselaps*, *Xenocalamus*); Prosymindae (genus *Prosymna*); Psammophinae (genera *Dipsina, Hemirhagerrhis, Psammophis, Psammophylax*, *Rhamphiophis*); Pseudaspidae (genus *Pseudaspis*); Pseudoxyrhophiidae (genera *Amplorhinus*, *Duberria*).

(2) Distribution

In this section, the species distributions are described for the entire range of the species. Thus, for the regional assessments, the description covers the range both within the region and outside the region. The descriptions are given in general terms and are meant to be further informed by the accompanying distribution maps. This differs from Bates et al. (2014), where references to specific towns and other political features were usually provided. The earlier approach has been avoided where possible because not all readers are intimately familiar with the names and locations of these geopolitical features. Regardless, some reference maps are provided (Figures 2.3 & 2.4) that show some geopolitical and geographic features to aid the reader with comprehension of the distribution section. For each assessment, distribution size is provided, defined by the area of the interpreted distribution polygons for each species. Distribution size is usually described in the narrative and these terms have been standardised: very small: < 500 km^2; small: 500–5 000 km^2; moderate: 5 000–20 000 km^2; large: 20 000–50 000 km^2; and widespread: > 50 000 km^2. Extent of Occurrence (EOO), and where applicable, Area of Occupancy (AOO), have been listed under the distribution section. It is important to note that the range size is not equivalent to either the EOO or the AOO (see Chapter 1).

(3) Countries of occurrence

Only countries in which there were confirmed records for each species are listed. In some cases, species could possibly occur in other countries, but they have not yet been confirmed so these countries are typically referred to only in the distribution section.

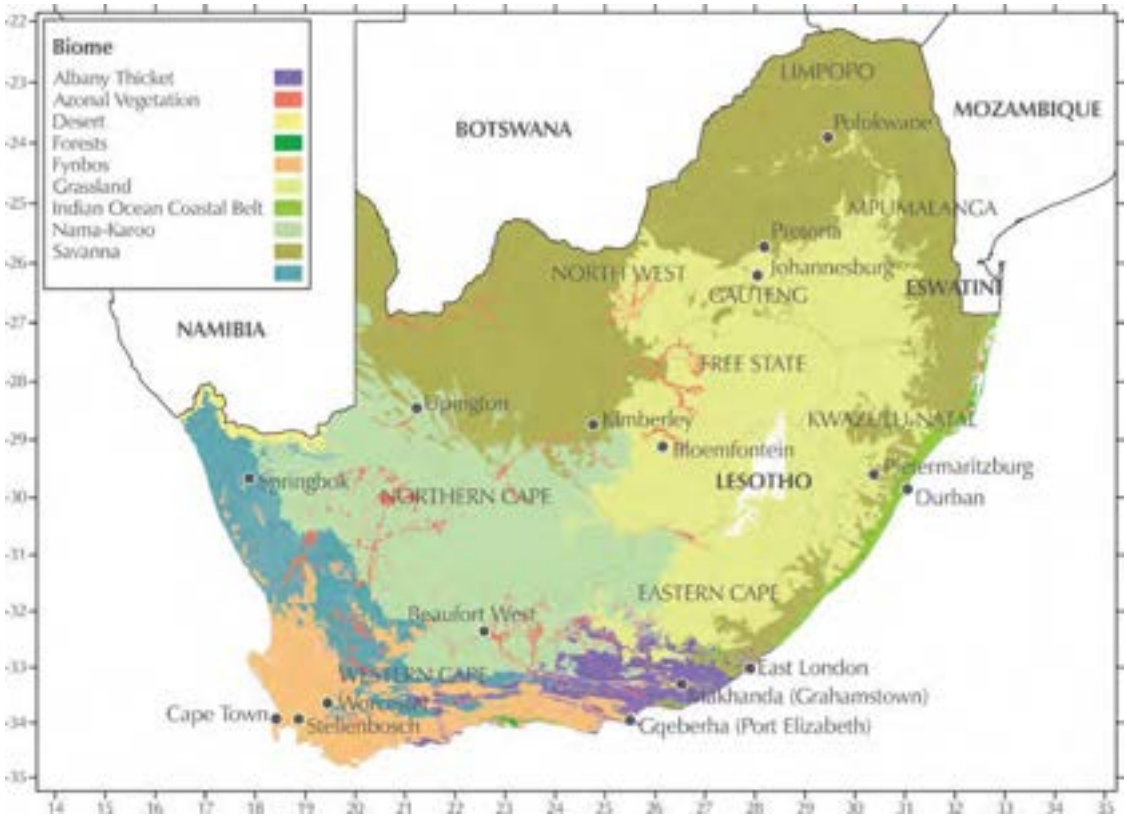


Figure 2.3. Main biomes and important place names within the assessment region.

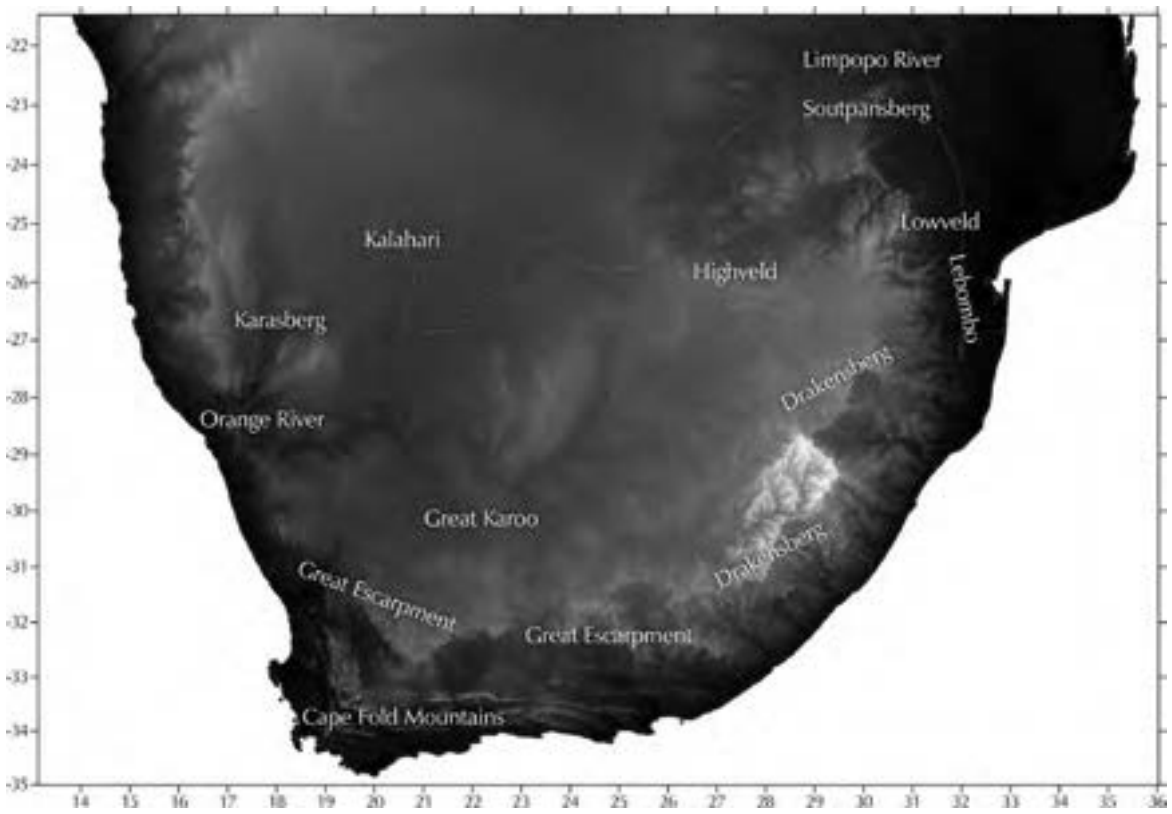


Figure 2.4. Terrain of the region and important landscape features. The elevation is indicated by the shading, with darkest shades showing low elevation and lightest shades showing high.

Figure 2.5. Formally protected areas (grey) in South Africa. Spatial data were not available for Eswatini or Lesotho.

(4) Threats

It is recognised that most, perhaps all, species have some level of threat to their populations. For example, habitat loss and climate change are worldwide impacts that apply to every species on the planet. For the current Red List assessments, however, only plausible and/or direct threats that put the species at increased risk of extinction are listed. This approach differs from Bates et al. (2014), where in many instances, a suite of possible threats was listed, some of which are unlikely to put a species at risk of extinction in a time frame relevant to these assessments (e.g., pollution, climate change, tsunami, hiking, ecotourism). That is not to say some of these threats do not exist or have not caused some impact or decline, only that the likelihood that such impacts would increase the risk of extinction is extremely low at present. For the current assessments, the IUCN guidelines are followed with the focus on threats that are likely to increase the risk of extinction (e.g., habitat loss; Figure 1.8) should those threats persist. In some cases, emerging threats have been mentioned as possibly being of concern in the future. For example, the arid regions of South Africa (e.g., Richtersveld, Kalahari) may become disproportionally affected by climate change in the future and for relevant species, a potentially negative response to climate change has been flagged as a potential threat to be monitored.

(5) Population trends

There are no estimates of population sizes or trends for most reptile species. Therefore, the trends have been inferred based on best knowledge of threats to the species and whether large portions of the distributions are within areas with ongoing habitat loss or are instead within protected areas (see Figure 2.5). It is recognised that most populations have likely experienced some measure of decline from their historical levels due to modern-day habitat loss and other factors. Despite this, declining populations are only indicated where there are notable impacts on populations that put a species at an increased risk of extinction at present. Otherwise, populations were considered to be stable.

(6) Recommendations

The recommendations outlined in the species assessments are those that have a direct bearing on the issues highlighted in the threats, population trends or the taxonomic sections. These recommendations are focussed on only the conservation or research actions that are achievable and that are relevant for improving the quality and accuracy of assessments in the future. This approach differs from Bates et al. (2014) where a compendium of research gaps, plus multiple types of conservation measures and possible actions were provided for many species.

2.2 Organisation of assessments

The taxonomic Class Reptilia includes lizards and snakes (Order Squamata), tuatara (Order Rhynchocephalia), tortoises/terrapins/turtles (Order Testudines) and crocodiles (Order Crocodilia). However, several large-scale phylogenies demonstrate conclusively that Class Reptilia is an artificial grouping. It is now well established that crocodiles are in the same clade as birds and dinosaurs (Archosauria). The Archosauria, together with the Testudines (Lee 2013), forms a sister clade to the Squamata. These two clades diverged at least 250 million years ago (Benton et al. 2015). Thus, the reptiles do not form a monophyletic taxon – the Orders in the Class Reptilia do not have a single common ancestor. Indeed, the name Diapsida applies to the clade that includes all reptiles, dinosaurs and birds, but this is not an official taxonomic rank.

The current taxonomic arrangement for reptiles is still used in scientific circles and therefore, crocodiles and Testudines are still commonly regarded as reptiles. Thus, both crocodiles (one species in the region) and Testudines are included in this volume, despite their phylogenetic placements outside the Class Reptilia (*sensu stricto*). The assessments are ordered by family according to phylogenetic placement within each of the main groupings of Crocodilia, Testudines and Squamata. Genera and species within each family are listed alphabetically. Subfamilies and subspecies have not been used as a level of organisation in the assessments.

Chondrodactylus bibronii (© L. Verburgt).

3

Species assessments

3.1

Crocodiles

Crocodylus niloticus (© E. Fouché).

Family **Crocodylidae**

Crocodylus niloticus Laurenti, 1768

Nile Crocodile

VU – Vulnerable A2ac (Regional)

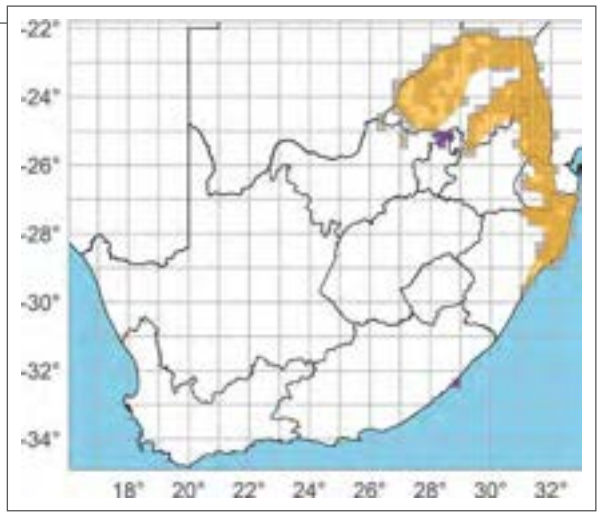
Assessors: Turner, A.A., Marais, J., Egan, V.T.

Previous Red List categories:
2019: Least Concern (Global IUCN assessment).
2014: Vulnerable (SARCA).

Assessment rationale: Although considered to be Least Concern globally, *C. niloticus* is listed as Vulnerable in the region due to declines in population of more than 30% over three generations (estimated at 144 years). Counts of two major subpopulations that have been conducted since the last assessment in 2014 indicate a reduction in the non-hatchling population of ± 20% (Warner et al. 2016; S. Ferreira, South African National Parks, pers. comm. 2017). Populations in some protected areas have seen ongoing declines while other populations have stabilised or increased slightly (Calverley & Downs 2017; Champion & Downs 2017; Ezat et al. 2018). Although there is some movement of individuals between waterbodies, it is unlikely that the regional population would be significantly enhanced by immigration from outside the region. Therefore, the regional status was not amended by taking the global population into account.

Taxonomic notes: There is population-level genetic structure within *C. niloticus* that corresponds with major river basins across continental Africa and Madagascar (Hekkala et al. 2010), but there has been no assessment as to whether this supports the five subspecies (see Uetz et al. 2020). The subpopulation in the region is referable to *C. niloticus cowiei*, and this subspecies may correspond with the genetically distinct population in the Limpopo River basin (see Hekkala et al. 2010). *Other important names*: see Hekkala et al. (2010) for a summary of all synonyms and subspecies.

Distribution: Widely distributed across eastern sub-Saharan Africa. In the region, it occurs from south of the Tugela River (Zinkwazi River) in KwaZulu-Natal province (Combrink et al. 2011), northwards into Mpumalanga, Limpopo and northeastern North West provinces. Surveys in the Limpopo province have filled in many information gaps in the northern



distribution – this is unlikely to represent an expansion in distribution, but rather better sampling as there is now known continuity in the distribution in this area (Egan 2019a). Scattered records exist from inland KwaZulu-Natal province (Bourquin 2004), probably as a result of individuals dispersing along river systems, and other extralimital records are probably referable to escapees from crocodile farms and private collections. Over the last century, the species has undergone a reduction in the extent of its range due to hunting and habitat transformation, particularly in the southern and western parts of the region. Historically, the species occurred in the

Crocodylus niloticus, Kwena Gardens, Sun City, North West province (© J. Marais).

Crocodylus niloticus, Quembo River, Angola (© C. Keates).

Crocodylus niloticus, Pafuri, Limpopo province (© R. van Huyssteen).

Eastern and Western Cape provinces (Feely 2010) but has become locally extinct in many areas in the early 1900s (Feely 2010; Combrink et al. 2011). The species also has become locally extinct from tributaries of the Limpopo River in parts of North West province (see Smith 1836, 1840). A population has been re-established in the Pilanesberg National Park (J. Power, pers. comm. 2020), and there is a population in Rust de Winter Dam in southern Limpopo province that might be either introduced, re-established or naturally colonised, with the population able to persist due to the presence of perennial waters in the dam (Jacobsen 1984). There are also online reports of crocodiles at another dam (Rhenosterkop Dam), lower in the Elands River in Mpumalanga province. In the 1980s six individuals were released at Dwesa Nature Reserve, Eastern Cape province (Combrink et al. 2011). These individuals may have reproduced (Combrink et al. 2011), and two to three individuals have been recorded from there in recent years (Venter & Conradie 2015). *EOO*: 323 000 km^2; *Distribution*: 144 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Cameroon, Democratic Republic of the Congo, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Kenya, Madagascar, Malawi, Mozambique, Namibia, Republic of the Congo, Rwanda, Somalia, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Inhabits swamps, lakes, dams, rivers and river mouths and coastal estuaries (Branch 1998). Crocodiles require sufficiently large natural habitats to support a sufficient prey base (Woodborne et al. 2012). *Habitat*: Bogs, creeks, fens and peatlands, lakes, marine neritic zones and estuaries, marshes, permanent inland deltas, rivers, streams, swamps.

Threats: The main threats include direct removals of individuals by netting and the loss and degradation of aquatic habitat due to channelling of waterways, damming and riparian habitat destruction for activities such as sand mining and brickmaking. Additional threats include persecution (killing of adults and destruction of nests, poisoning), invasive vegetation, fire (which reduces nesting success), as by-catch in fishing nets, dry-land clearing around wetlands (Egan 2019b) and pollution (Buah-Kwofie et al. 2018; Humphries et al. 2021). A large area (>7 000 ha) in northern Limpopo province has been identified as a Special Economic Zone to stimulate mining and energy activities (Government Gazette no. 41287 of 2017) and this could be a threat in the future. *Use and trade*: The CITES trade database shows significant recent exports from South Africa of trophies, bodies, bones, teeth and skins from wild and ranched sources (UNEP-WCMC 2020). Commercial trade reported to CITES shows 1 799 trade events involving animals sourced from the wild and ranches between 2017 and 2019 (UNEP-WCMC 2020). Harvesting from the wild for local traditional medicine does not fall under CITES. It is difficult to quantify the trade fully, as most CITES exports indicate the number of derived products

Family **Crocodylidae**

being exported (e.g., leathers, bones, etc.) rather than the number of individuals harvested to create those products and statistics on removals from local harvesting are lacking.

Population trend: Although there has been an inferred decline of 30% over the last three generations, the overall population appears to have stabilised with the declines either slowing or having ceased. In Limpopo province, some subpopulations have been stable for two decades (e.g., from parts of the Olifants River system), but the subpopulation from the Letaba River upstream of the Kruger National Park has crashed and only partially recovered (Egan & Rodgers 2019, 2020). The subpopulations from the Limpopo and Luvuvhu rivers have shown increases and the Limpopo River main-stem population has increased dramatically since earlier surveys (Jacobsen 1984; Jacobsen & Kleynhans 1993). Current summary figures for subpopulations in KwaZulu-Natal province are not available, although it is assumed that some are increasing while others are decreasing (e.g., Calverley & Downs 2017; Champion & Downs 2017; Ezat et al. 2018) likely resulting in little net change. Conservation authorities released six juveniles into Dwesa Nature Reserve, Eastern Cape province, in 1977 (Pooley 1980). A few individuals have been sighted in the last two decades (Feely 2010; Venter & Conradie 2015) and the population may have successfully reproduced (Venter & Conradie 2012).

Conservation and research recommendations: An improvement of water quality management in rivers where *C. niloticus* occurs, including all upstream stretches that feed the main habitat, would improve habitat for this species. A management response for invasive carp where they may cause pansteatitis in *C. niloticus* is needed. An updated, countrywide census of the *C. niloticus* population would improve our knowledge regarding population trends and this could be accomplished through a comprehensive national monitoring programme for wild Nile Crocodiles.

3.2
Testudines
(terrapins and tortoises)

Pelomedusa subrufa (© R. van Huyssteen).

Family **Pelomedusidae**

Pelomedusa galeata (Schoepff, 1792)

South African Helmeted Terrapin

Regional near-endemic

LC – Least Concern (Global)

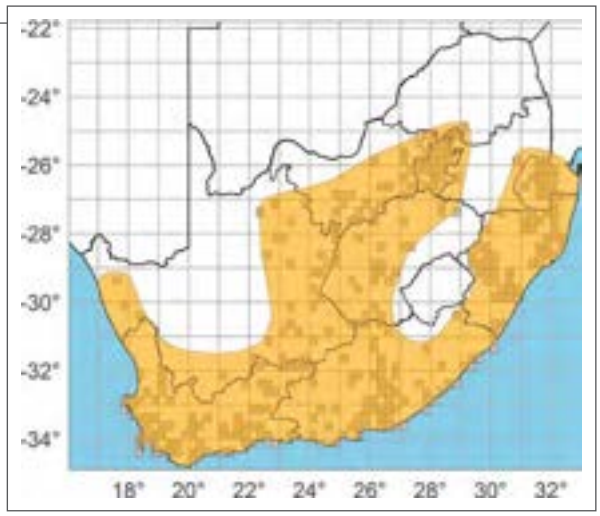
Assessors: Hofmeyr, M.D., Fritz, U.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: This is a widespread and common terrapin that can tolerate harsh environmental conditions. There are no significant threats.

Taxonomic notes: This species, together with other helmeted terrapins throughout sub-Saharan Africa, Madagascar and the southwestern Arabian Peninsula, were previously combined under the name *P. subrufa*. Phylogenetic evidence indicates that *P. galeata* in western South Africa represents a separate lineage and a possible candidate new species (Petzold et al. 2014; Fritz et al. 2015). *Other important names*: *Pelomedusa subrufa*.

Distribution: This species occurs across South Africa, Eswatini and in southern Mozambique. However, it has not been recorded from most of the Northern Cape province, South Africa, nor from Lesotho (Vamberger et al. 2019a). It is not yet known if the range



of *P. galeata* extends into southern Namibia or southern Botswana, nor how far north in South Africa it occurs. Most localities in South Africa and Eswatini previously ascribed to *P. subrufa* are now considered to be *P. galeata*. *EOO*: 1 100 900 km^2; *Distribution*: 778 000 km^2.

Countries of occurrence: South Africa, Eswatini, Mozambique.

Habitat and ecology: Occurs in fresh or stagnant waterbodies, including seasonal pans, marshes, flooded quarries and farm dams, and avoids mountainous terrain and forests (Boycott & Bourquin 2000). *Habitat*: Grassland, Savanna, Shrubland, wetlands.

Threats: Livestock farming and agriculture contribute to the presence of artificial waterbodies, which are often colonised by these terrapins. Pollution of waterbodies due to agricultural practices may, however, pose a threat. The terrapins occur in a variety of wetland habitats and appear able to move overland for substantial distances, thus fragmentation of habitat is probably negligible. *Use and trade*: In some parts of Africa humans eat terrapins, but there is no information available for South Africa.

Population trend: The species is relatively common and fairly tolerant of disturbance and is therefore not considered to be in decline (Boycott & Bourquin 2008).

Conservation and research recommendations: The northern extent of the range, and whether it occurs sympatrically with *P. subrufa*, should be assessed.

Pelomedusa galeata, Rooipoort Nature Reserve, Northern Cape province (© W. Conradie).

Pelomedusa subrufa (Bonnaterre, 1789)

African Helmeted Terrapin

LC – Least Concern (Regional)

Assessors: Fritz, U., Hofmeyr, M.D.

Previous Red List categories:
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no substantial threats.

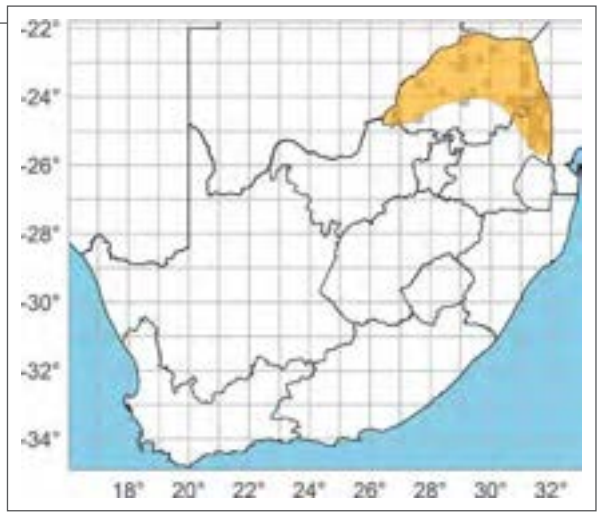
Taxonomic notes: Phylogenetic studies show deep divergences within *P. subrufa sensu lato*, with some of these clades already having been either raised or described as full species. The taxonomic status of the remaining clades remains to be assessed. There is a contact zone between this species and *P. galeata* in northern South Africa, and given that they are difficult to identify morphologically, this has caused uncertainty with regards to where the geographic range edges of the two taxa lie. A recent record of *P. subrufa* was confirmed by DNA barcoding (K. Tolley, unpubl. data 2021), extending the known range by 100 km south. *Other important names*: none.

Distribution: Widespread across southern Africa and parts of East Africa (Fritz et al. 2015; Rhodin et al. 2021), with a possibly introduced population in Madagascar (Petzold et al. 2014). In South Africa, it occurs in the northeast, but the southern extent of the range is not yet known due to confusion with *P. galeata*. *EOO*: 155 000 km²; *Distribution*: 109 000 km².

Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Kenya, Madagascar, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Occurs in fresh or stagnant waterbodies, including seasonal pans, flooded quarries and farm dams, but avoids mountainous terrain and forests (Boycott & Bourquin 2000). Can cope with arid conditions by burrowing underground during dry periods and may survive up to six years underground (Petzold et al. 2014). *Habitat*: Savanna, wetlands.

Threats: Livestock farming and agriculture may constitute an advantage because terrapins often colonise artificial dams built for livestock and irrigation. However, pollution of waterbodies may pose a threat.



Pelomedusa subrufa, Soutpansberg, Limpopo province (© R. van Huyssteen).

Pelomedusa subrufa, pan near Bonavae, Angola (© W. Conradie).

Family **Pelomedusidae**

Pelomedusa subrufa, Soutpansberg, Limpopo province (© M. Petford).

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs across many areas that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The southern limit of this species' range and whether it occurs sympatrically with *P. galeata* should be assessed.

Family **Pelomedusidae**

Pelusios castanoides Hewitt, 1931

Yellow-bellied Hinged Terrapin

VU – Vulnerable A4ac (Regional)

Assessors: Hofmeyr, M.D., Boycott, R.C.

Previous Red List categories:
2014: Least Concern (SARCA).
1996: Lower Risk/Least Concern (Global IUCN assessment).

Reason for recent change: Genuine.

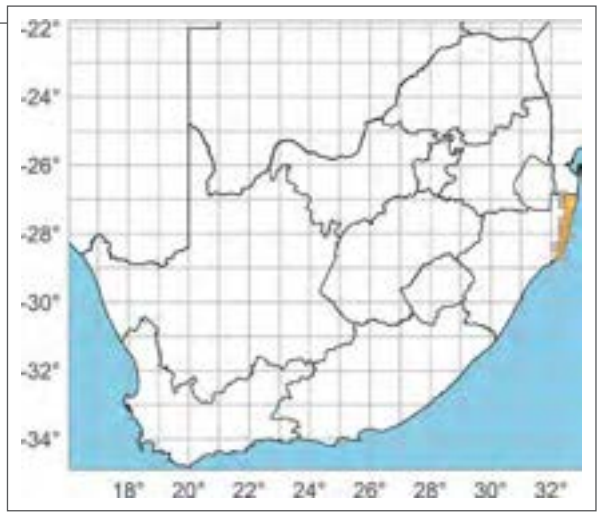
Assessment rationale: Land cover maps (Schoeman et al. 2013; Jewitt et al. 2015; Skowno et al. 2019) show that apart from conservation areas, most habitat over the range of this species is anthropogenically transformed by forestry and cultivation. These negative influences on the species are compounded by pollution and the filling or drainage of swamps, marshes, pans and vleis. Based on land cover maps, at least 20% of the species' original range is estimated to have been destroyed or degraded over the past 30 years (1.5 generations). An estimated population decline of 10–20% over the next 30 years (1.5 generations) will result in a total decline in excess of 30%, qualifying the species as Vulnerable. Distribution records suggest the nearest subpopulation is several hundred kilometres to the north, possibly isolating the regional subpopulation. Therefore, this species is treated as an endemic and the regional status was not amended in light of its isolation.

Taxonomic notes: A recent phylogenetic assessment of *Pelusios* confirmed that *P. castanoides* is a valid species, but the validity of the Malagasy and Seychellois subspecies is not yet resolved (Fritz et al. 2011, 2013). *Other important names*: none.

Distribution: The species occurs in tropical eastern Africa from southeastern Kenya through to South Africa. Occurrence records (Rhodin et al. 2021) show a large disjunction between central Mozambique and South Africa. It is also present in Madagascar and the Seychelles. Its range in South Africa is restricted to northeastern KwaZulu-Natal province. *EOO*: 7 500 km²; *Distribution*: 5 400 km².

Countries of occurrence: Kenya, Madagascar, Malawi, Mozambique, Seychelles, South Africa, Tanzania.

Habitat and ecology: Occurs in temporary pans and permanent well-vegetated waterbodies in subtropical/tropical coastal regions (Bourquin 2004). *Habitat*: Forest, Savanna, wetlands, marshes.



Threats: In KwaZulu-Natal province this species' habitat has probably been reduced through the filling or drainage of swamps, marshes, pans and wetlands. At some localities, pollution of the habitat undoubtedly affects terrapins. The long-term effects of insecticide spraying for the control of mosquitoes is unknown and poses an additional threat to survival.

Population trend: The species is considered in decline given that large areas of suitable habitat have been transformed by a variety of anthropogenic factors, with a concomitant decrease in this species' population size.

Conservation and research recommendations: General conservation of the wetland habitats that it inhabits is recommended (Boycott & Bourquin 2000). Research into the biology, population numbers and habitat status of this species is needed.

Pelusios castanoides, Hluhluwe, KwaZulu-Natal province (© T. Ping).

Family **Pelomedusidae**

Pelusios rhodesianus Hewitt, 1927

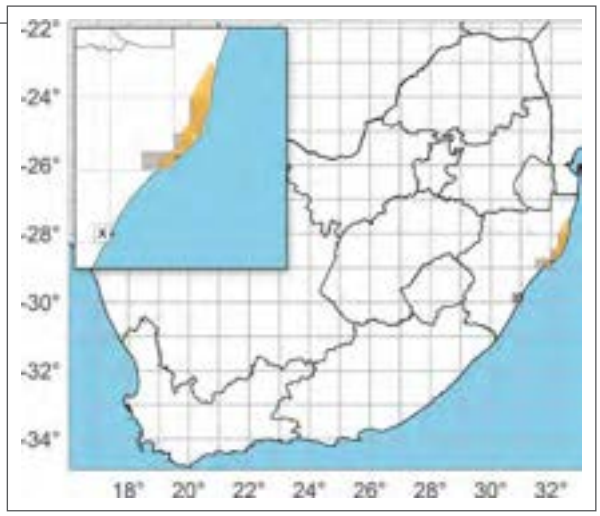
Variable Hinged Terrapin

VU – Vulnerable A4ace (Regional)

Assessors: Hofmeyr, M.D., Boycott, R.C.

Previous Red List categories:
2014: Vulnerable (SARCA).
1996: Lower Risk/Least Concern (Global IUCN assessment).

Assessment rationale: The southern part of the distribution shows a continuing decline in habitat quantity and quality as a result of wetland destruction and pollution, as well as increased agricultural (sugarcane fields) and silviculture (timber plantations) developments (Rouget et al. 2004a; Broadley & Boycott 2008a). In South Africa, the southernmost population at Bluff Nature Reserve, KwaZulu-Natal province, is considered extinct (Broadley & Boycott 2008a). Few records for the species fall within the iSimangaliso Wetland Park and World Heritage Site, and most of the coastal and inland habitat beyond this park degraded dramatically between 1994 and 2011 (Jewitt et al. 2015). Populations south of Umlalazi Nature Reserve may also be locally extinct due to gum plantations and mining in recent years.



Assuming that the southern populations are extinct, the EOO for the species in South Africa has been reduced to less than 50% of the original EOO. Based on land cover maps, an estimated 30–40% of the original range has been destroyed or degraded over the past 30 years (1.5 generations). These threats have not ceased (Schoeman et al. 2013; Jewitt et al. 2015). The nearest subpopulation is several hundred kilometres to the north, effectively isolating the regional subpopulation. Therefore, this species is treated as an

Pelusios rhodesianus, Mtubatuba, KwaZulu-Natal province (© J. Harvey).

endemic and the regional status was not amended after taking its isolation into account.

Taxonomic notes: The southern subpopulation of *P. rhodesianus* in KwaZulu-Natal province, South Africa, is separated from the main distribution by ± 900 km, although genetic results indicate that these populations are conspecific (Kindler et al. 2016). The large geographic gap, but genetic similarity, may indicate that the South African subpopulation is the result of a historic introduction, although this requires further research. *Other important names*: none.

Distribution: Widespread across central and southern Africa, from Angola into East Africa, extending southwards into Mozambique and Zimbabwe (Rhodin et al. 2021). The subpopulation in South Africa appears to be isolated from the main distribution (Boycott & Bourquin 2000; Rhodin et al. 2021). It has a small range along the northeastern coastal region of KwaZulu-Natal province (Boycott & Bourquin 2000) and may once have occurred as far south as Durban. However, subpopulations between St Lucia and Durban are considered extinct (Bourquin 2004; Broadley & Boycott 2008a). *EOO*: 4 500 km^2; *Distribution*: 3 200 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Malawi, Mozambique, Namibia, Republic of the Congo, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs in temporary pans and semi-permanent, well-vegetated waterbodies and marshes in sandy coastal regions in South Africa, but farther inland throughout the main distribution that is further north (Bourquin 2004). *Habitat*: Savanna, wetlands.

Threats: In South Africa, the species has experienced a decline in extent and quality of habitat as a result of the filling of wetlands and, at some localities, pollution of the habitat (Broadley & Boycott 2008a). Further fragmentation of habitat has probably occurred due to the expansion of agriculture (sugarcane fields), silviculture and mining.

Population trend: The species is considered to be in decline and some local subpopulations seem to have become locally extinct in southern KwaZulu-Natal province (Broadley & Boycott 2008a).

Conservation and research recommendations: The taxonomic status of the South African subpopulation is in need of assessment. General conservation of the wetland habitats that this species inhabits is recommended (Boycott & Bourquin 2000).

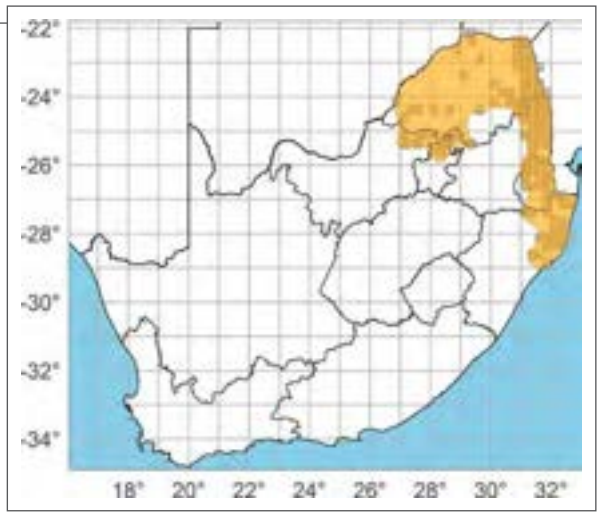
Family **Pelomedusidae**

Pelusios sinuatus (Smith, 1838)

Serrated Hinged Terrapin

LC – Least Concern (Regional)

Assessors: Hofmeyr, M.D., Boycott, R.C.



Previous Red List categories:
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant with no significant threats.

Taxonomic notes: A phylogenetic analysis showed deep divergences within *P. sinuatus* from South Africa and Botswana, suggesting that there could be cryptic taxa (Fritz et al. 2011; Vamberger et al. 2019b). Some cryptic taxa may correspond to the coastal and inland subspecies described by Hewitt (1927) from KwaZulu-Natal province, South Africa, and northeastern Zambia. *Other important names*: *Pelusios sinuatus zuluensis*.

Distribution: Widespread in tropical eastern Africa (Boycott & Bourquin 2000) from Somalia to South Africa and Eswatini (Rhodin et al. 2021). In the region, it occurs primarily in the northeast, southwards into KwaZulu-Natal province and westwards across the northern regions. *EOO*: 295 000 km^2; *Distribution*: 182 000 km^2.

Countries of occurrence: Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Somalia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in inland lakes and the larger perennial rivers of upland Savanna, lowveld and the coastal belt, in fresh or stagnant waterbodies including seasonal pans, flooded quarries and farm dams. Abundant in medium to large perennial rivers (Boycott & Bourquin 2000). *Habitat*: Savanna, wetlands.

Threats: Livestock farming and agriculture may constitute an advantage because terrapins often colonise artificial dams built for livestock and irrigation. However, pollution of waterbodies may pose a threat even within protected areas such as the Kruger National Park (Broadley & Boycott 2009).

Population trend: This widespread species can utilise man-made waterbodies such as dams and flooded quarries (Broadley & Boycott 2009). Some parts of the range are also not significantly impacted by habitat transformation. The population size is therefore assumed to be stable and is possibly increasing in areas.

Conservation and research recommendations: No recommendations.

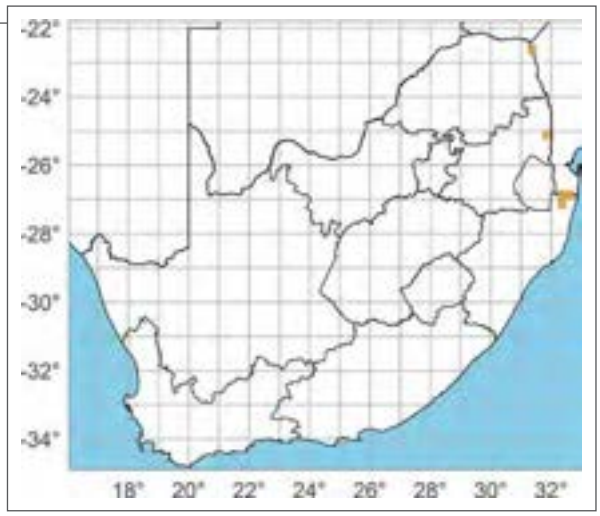
Pelusios sinuatus, Pilanesberg, North West province (© G. Alexander).

Pelusios sinuatus, Pafuri, Limpopo province (© R.I. Stander).

Family **Pelomedusidae**

Pelusios subniger (Bonnaterre, 1789)

Black-bellied Hinged Terrapin



LC – Least Concern (Regional)

Assessors: Hofmeyr, M.D., Boycott, R.C.

Previous Red List categories:
2014: Least Concern (SARCA).
1996: Lower Risk/Least Concern (Global IUCN assessment).

Assessment rationale: Although this species has a limited distribution in the region, most of this distribution is within protected areas with no significant threats.

Taxonomic notes: Recent phylogenetic analyses revealed cryptic taxa within this species (Fritz et al. 2011, 2013). The Malagasy and Seychellois populations cannot be differentiated from populations in South Africa and Mozambique, rendering the subspecies *P. s. parietalis* invalid (Fritz et al. 2013). *Other important names*: none.

Distribution: Widespread in eastern and southern Africa (Boycott & Bourquin 2000; Rhodin et al. 2021), but peripheral in South Africa. There are a few scattered records in northeastern South Africa, suggesting it could be more widespread than currently known. Populations in Seychelles and Madagascar are considered introduced. *EOO*: 26 000 km^2; *Distribution*: 3 400 km^2.

Countries of occurrence: Botswana, Burundi, Democratic Republic of the Congo, Madagascar, Malawi, Mozambique, Seychelles, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: *Pelusios subniger* inhabits ephemeral pans and ponds in temporary river courses in eastern and southeastern Africa. In the region, it occurs primarily in temporary pans in subtropical Lowveld habitats (Boycott & Bourquin 2000). *Habitat*: Savanna, wetlands.

Threats: No significant threats.

Population trend: In spite of the small geographic range of this species in South Africa, it occurs in an area where there has been little habitat transformation and it is widespread elsewhere. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Pelusios subniger, North Island, Seychelles (© D.W. Pietersen).

Pelusios subniger, Banhine National Park, Mozambique (© E.W. Pietersen).

Family **Testudinidae**

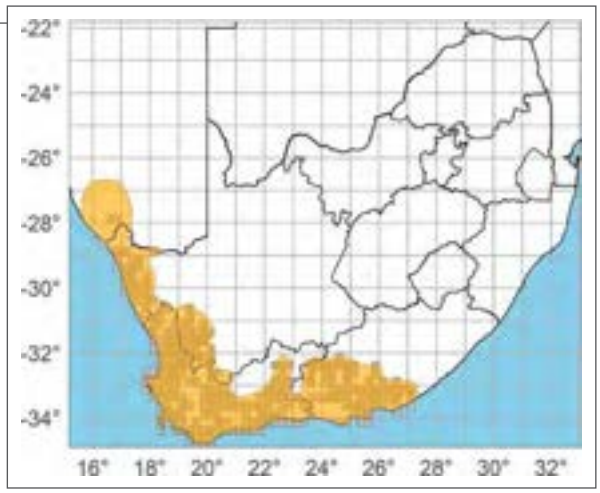
Chersina angulata (Schweigger, 1812)

Angulate Tortoise

South African near-endemic

LC – Least Concern (Global)

Assessors: Hofmeyr, M.D., Keswick, T.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: *Chersina angulata* is widespread and common with no major threats.

Taxonomic notes: Although phylogenetic clades were found for the western and southern regions of South Africa (Daniels et al. 2007), these clades appear to relate to differences at the subspecies level rather than the species level (Spitzweg et al. 2020). *Other important names*: none.

Distribution: Widespread along the southwestern and western margin of South Africa, extending into southern Namibia. It also occurs on several islands off the southwestern coast of South Africa. Introduced, established populations were reported further north at Swakopmund and Walvis Bay in Namibia (Griffin 2003). *EOO*: 450 000 km^2; *Distribution*: 223 000 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in several habitat types including Fynbos, Succulent Karoo and Nama-Karoo, from coastal plains to montane habitats at elevations of up to 1 200 m a.s.l. These tortoises prefer a sandy substratum in which they partially bury themselves when taking refuge under vegetation. They also occur in rocky areas where they hide under large boulders or among rocks. *Habitat*: Shrubland.

Threats: Predation by Pied Crows (*Corvus albus*) is a threat to this species, particularly as crow populations have increased in the region (Fincham & Lambrechts 2014; Underhill & Brooks 2014; Cunningham et al. 2016; Fincham & Nupen 2016). There is some threat to *C. angulata* from fire, particularly in open sandy areas where there are few retreats (rock outcrops,

Chersina angulata, Noup, Northern Cape province (© G. Alexander).

Chersina angulata, Sandberg Fynbos Reserve near Elim, Western Cape province (© R. van Huyssteen).

hollow logs or animal burrows (Baard et al. 2001; Branch 2008). *Use and trade*: *Chersina angulata* was an important historical source of food (Avery et al. 2004) but the exploitation of tortoises for food is no longer prevalent. Historically, the shell was used decoratively in tobacco boxes (B.T. Henen, pers. comm. 2013). The documented export of live animals from South Africa comprised 1 567 individuals between 2000 and 2016 and poaching also occurs (Henen et al. 2013). The species is bred in captivity, but it is not clear to what extent this contributes to trade.

Population trend: *Chersina angulata* is not considered to be in decline. It is common in suitable habitat in South Africa, where it can reach densities of 30–35 individuals/ha (Branch 1984; Van Heezik et al. 1994). Density on islands free of natural predators (e.g., Dassen Island) can be as high as 100 individuals/ha (M.D. Hofmeyr, unpubl. data 2018).

Conservation and research recommendations: Efforts to address increasing threats from Pied Crow predation and overly frequent fires should be considered.

Family **Testudinidae**

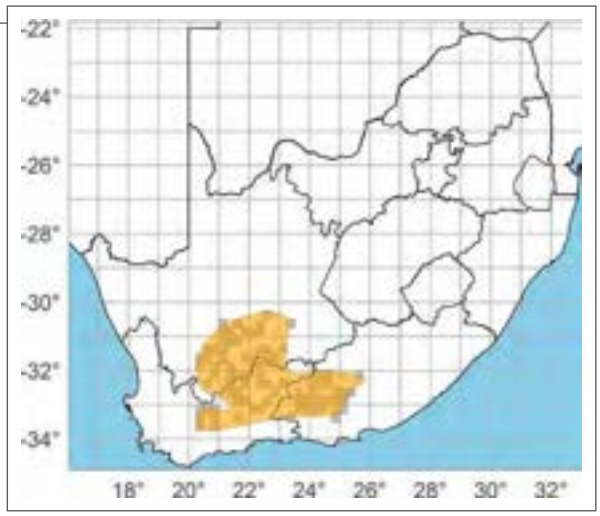
Chersobius boulengeri (Duerden, 1906)

Karoo Dwarf Tortoise

South African endemic

EN – Endangered A4ace (Global)

Assessors: Hofmeyr, M.D., Loehr, V.J.T., Baard, E.H.W., Juvik, J.O.



Previous Red List categories:

2018: Endangered (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment) as *Homopus boulengeri*.
2014: Near Threatened (SARCA) as *Homopus boulengeri*.

Reason for recent change: Genuine.

Assessment rationale: Most localities (30 of 35) no longer harbour viable populations and nearly 50% of the range of *C. boulengeri* is moderately or severely degraded with changes from a shrubby to a grassy landscape (Stevens et al. 2015). The species is thought to be in decline based on an estimate of a reduction in population size of approximately 30% over the past 25 years (one generation) and a projected reduction of at least another 30% over the next 50 years (two generations), for a total reduction over three generations of approximately 60%.

Taxonomic notes: The genus *Homopus* was found to be paraphyletic, warranting resurrection of the genus *Chersobius* to accommodate the five-toed *Homopus* species (*C. boulengeri, C. signatus* and *C. solus*; Hofmeyr et al. 2017). *Other important names*: *Homopus boulengeri*.

Chersobius boulengeri, Matjiesfontein, Western Cape province (© C. & S. Dorse).

Chersobius boulengeri, Beaufort West, Western Cape province (© L. Verburgt).

Distribution: Occurs across the southwestern Great Karoo and along the region of the Great Escarpment, eastwards to Cradock in the Eastern Cape province. *EOO*: 144 000 km²; *Distribution*: 115 000 km².

Country of occurrence: South Africa.

Habitat and ecology: *Chersobius boulengeri* occurs in association with dolerite ridges and rocky outcrops of the southern Succulent and Nama-Karoo biomes, and peripherally in the Albany Thicket biome in the southeast, at elevations of approximately 800–1 500 m a.s.l. These tortoises rely on shrubs and geophytes rather than grasses for food and make extensive use of rocky terrain for cover (Hofmeyr et al. 2018a). *Habitat*: Shrubland.

Threats: Threats to this species include habitat degradation due to agriculture and overgrazing, and possibly increased predation from corvids (e.g., White-necked Raven, *Corvus albicollis* and Pied Crow, *Corvus albus* (Loehr & Keswick 2022), which have expanded in distribution and abundance (see Fincham & Lambrechts 2014; Underhill & Brooks 2014; Cunningham et al. 2016; Fincham & Nupen 2016; Joseph et al. 2017). Furthermore, some areas of the range have undergone a vegetation shift to an increasing grass component in the Shrublands (Masubelele et al. 2014; Du Toit et al. 2015). It is not known how this change could impact the abundance of this species. Although infrastructure development associated with shale gas fracking had been considered a potential threat, this technology is unlikely to be developed in South Africa given that the extraction costs exceed the projected gains (Orthofer et al. 2019).

Population trend: Occurs at low densities (Loehr & Keswick 2022) and like congeners, it probably has a low dispersal capability (Loehr 2015). Repeated surveys at 35 sites (2005–2017) covering 50% of the distribution where the species had been previously documented confirmed just one occupied site with a population that appeared to be declining (Loehr & Keswick 2022) and a few individuals at four other sites, while tortoises were absent from the remainder of sites. There are very few recent records of live individuals. The population is therefore considered to be in decline.

Conservation and research recommendations: A formal stewardship programme for private landowners could conserve or provide natural habitat, and management of the corvid invasion into this species' range could reduce predation. This could include reduction in artificial nesting sites for Pied Crows (e.g., electricity pylons and telephone poles). Additional surveys at historical sites would be helpful for assessing the species' decline.

Family **Testudinidae**

Chersobius signatus (Gmelin, 1789)

Speckled Dwarf Tortoise

South African endemic

EN – Endangered A4ace (Global)

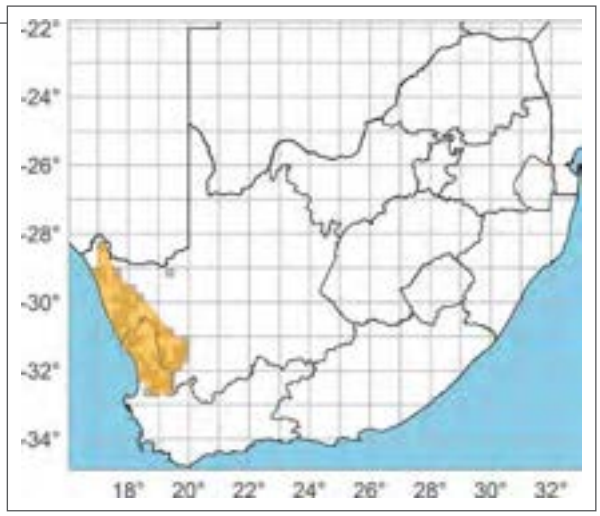
Assessors: Hofmeyr, M.D., Loehr, V.J.T., Baard, E.H.W.

Previous Red List categories:
2018: Endangered (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment) as *Homopus signatus*.
2014: Vulnerable (SARCA) as *Homopus signatus*.
1996: Near Threatened (Global IUCN assessment) as *Homopus signatus*.

Reason for recent change: Genuine.

Assessment rationale: Past population declines are estimated at 30–40% over the last 25–50 years (1–2 generations). There have been local extinctions at some localities due to a decline in habitat quality and extent, as well as increased predation by invasive Pied Crows (*Corvus albus*). These causes are projected to continue, and the combined past and future declines are projected to exceed 50%.

Taxonomic notes: Recently transferred from *Homopus* to *Chersobius*. Colour patterns that were previously used to distinguish subspecies appears to relate to crypsis on different substrates (Daniels et al. 2010) and these subspecies are no longer recognised. The status of the subpopulation from the Pofadder area requires further investigation (Daniels et al. 2010). Records of this species from Namibia (Mertens 1955, 1971) are referable to *C. solus* (Branch 2007). *Other important names*: *Homopus signatus*; *Homopus signatus signatus*; *Homopus signatus cafer*.



Distribution: Occurs along the arid western margin of South Africa in the Western and Northern Cape provinces, to approximately 170 km inland in the south and 100 km inland in the north. There is a single record from approximately 250 km inland

Chersobius signatus, Kliprand, Western Cape province (© C. & S. Dorse).

Chersobius signatus, Nieuwoudtville, Northern Cape province (© C. & S. Dorse).

Chersobius signatus, Springbok, Northern Cape province (© C. & S. Dorse).

near Pofadder in the Northern Cape province. *EOO*: 93 000 km²; *Distribution*: 56 000 km².

Country of occurrence: South Africa.

Habitat and ecology: Occurs on rocky terrain within the Succulent Karoo and northern Fynbos biomes from sea level to around 1 000 m a.s.l. (Boycott 1989; Loehr 2002). Individuals shelter in rock crevices or under medium to large boulders and rock slabs, which provides protection against temperature extremes and predation (Loehr 2018). *Habitat*: Shrubland.

Threats: Habitat destruction and degradation from agriculture and overgrazing has fragmented the range, and increased predation by Pied Crows poses a threat (Loehr 2017). Expected changes in rainfall pattern and temperature are likely to have a negative effect on growth rates and fecundity (Loehr et al. 2007a,b; 2009, 2011). *Use and trade*: Harvest from the wild for the pet trade is low. Since 1987, only 46 individuals have been reported as imported for the pet trade (UNEP-WCMC 2020). Given that large females are usually the most sensitive life stage, their removal could destabilise subpopulations, particularly in fragmented habitats.

Population trend: This species may have declined as much as 66% in some areas (Loehr 2017). It has become locally extinct in some localities in the southwestern part of the range and population densities across the range are low (Hofmeyr et al. 2018a).

Conservation and research recommendations: A formal stewardship programme for private landowners could conserve or provide natural habitat, and management of the Pied Crow invasion into this species' range could reduce predation. Research is required to better assess population declines and threats.

Family **Testudinidae**

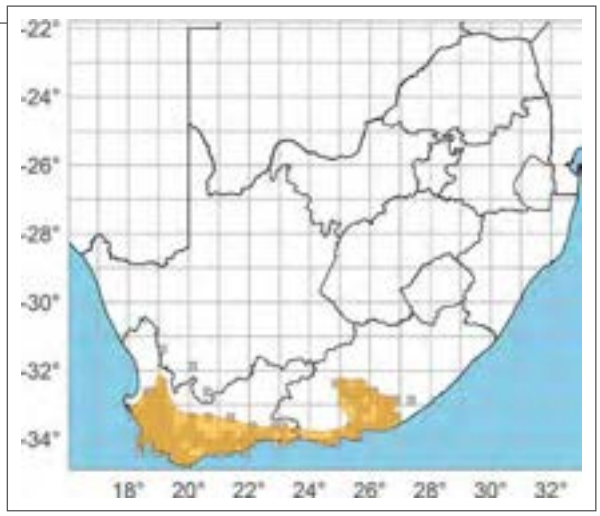
Homopus areolatus (Thunberg, 1787)

Parrot-beaked Tortoise

South African endemic

LC – Least Concern (Global)

Assessors: Hofmeyr, M.D., Keswick, T.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and occurs in several protected areas, with no major threats.

Taxonomic notes: A recent phylogenetic study indicates fairly low divergence between two clades of this species (Hofmeyr et al. 2020), although there are habitat differences between the two groups. *Other important names*: none.

Distribution: Widespread along the entire southern margin of South Africa, from the west coast to the southern Eastern Cape province, extending several hundred kilometres inland in some areas (Boycott & Bourquin 2000). There are some isolated records inland along the Great Escarpment and southern Karoo. *EOO*: 233 000 km^2; *Distribution*: 88 500 km^2.

Country of occurrence: South Africa.

Habitat and ecology: *Homopus areolatus* is associated with Fynbos, Renosterveld and open Thicket vegetation (Branch 2008), from sea level to elevations of 1 300 m a.s.l. in the interior. *Habitat*: Shrubland.

Threats: This species' small size makes individuals vulnerable to predation by Pied Crows (*Corvus albus*), which have become established within this tortoise's range (Fincham & Lambrechts 2014). Furthermore, an increase in fire frequency can decimate populations. *Use and trade*: This species is not heavily traded. Recorded imports of wild-caught animals originating in South Africa for the pet trade number just over 200 animals between 1982 and 2018 (UNEP-WCMC 2020). Similarly, imports of captive bred individuals from South Africa and other countries number just over 100 animals between 1987 and 2018 (UNEP-WCMC 2020).

Population trend: Habitat destruction for agriculture and housing developments have resulted in habitat fragmentation and local population reductions and local extinctions in the recent past, but this species is not considered to be in decline at present.

Conservation and research recommendations: The population should be monitored to assess what effects land transformation is having on the species, while efforts to address increasing threats from Pied Crow predation and overly frequent fires should be considered.

Homopus areolatus, J.N. Briers-Louw Nature Reserve, Western Cape province (© T. Ping).

Homopus areolatus, West Coast National Park, Western Cape province (© D.W. Pietersen).

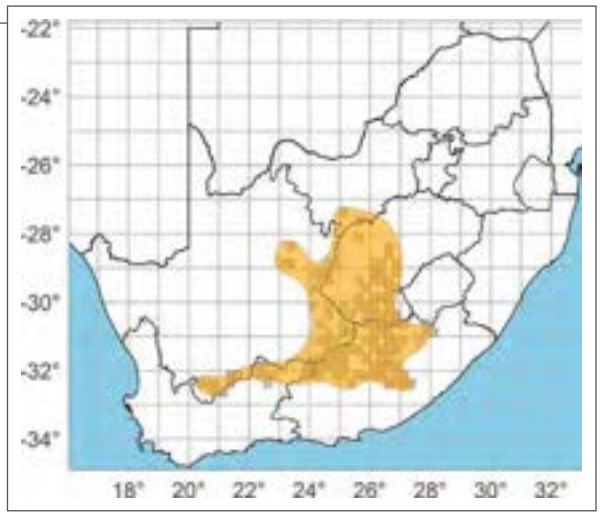
Homopus femoralis Boulenger, 1888

Greater Padloper

South African endemic

LC – Least Concern (Global)

Assessors: Hofmeyr, M.D., Keswick, T.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and relatively common in some areas with no major threats.

Taxonomic notes: A recent phylogenetic study indicates that the western-most group along the escarpment forms a distinct lineage (Hofmeyr et al. 2017), which requires further investigation. *Other important names*: none.

Distribution: Occurs along the southern Great Escarpment and northwards into the central, arid regions of South Africa. Although reported as occurring in southeastern Lesotho (Greig & Burdett 1976; Branch 1998; Ambrose 2006; Branch 2008), this has not been confirmed by actual records. *EOO*: 307 000 km^2; *Distribution*: 188 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs at elevations between 900 and 1 900 m a.s.l. in a variety of vegetation types including Highveld Grassland, Nama-Karoo, Fynbos and Woodland. The species has some association

Homopus femoralis, Nieu-Bethesda, Eastern Cape province (© R.I. Stander).

Homopus femoralis, Tsolwana Nature Reserve, Eastern Cape province (© W. Conradie).

Family **Testudinidae**

Homopus femoralis, near Altyre, Eastern Cape province (© B.W. Lumb).

with rocky terrain, but individuals are most often found under vegetation in Shrubland (V.J.T. Loehr, pers. comm. 2018). *Habitat*: Savanna, Shrubland, Grassland.

Threats: No major threats, although high road mortality has been reported in some regions (Loehr 2012).

Population trend: This species occurs mainly in regions that have not been significantly impacted by habitat transformation, thus the population size is not thought to have declined significantly.

Conservation and research recommendations: No recommendations.

Family **Testudinidae**

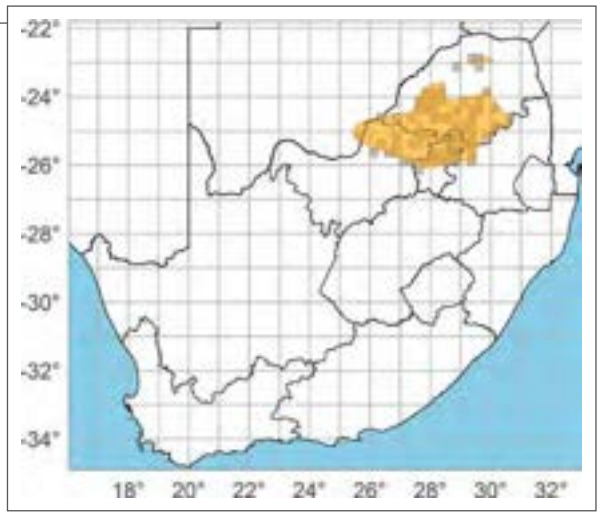
Kinixys lobatsiana (Power, 1927)

Lobatse Hinged Tortoise

South African near-endemic

VU – Vulnerable (A4cde) (Global)

Assessors: Hofmeyr, M.D., Boycott, R.C.



Previous Red List categories:
2018: Vulnerable (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: The range of *K. lobatsiana* falls mainly within Limpopo province, South Africa, for which 15% of land cover is considered developed or degraded (Limpopo Environment Outlook Report 2016) due to agricultural conversion, urban development, mining and invasive species (Skowno et al. 2019). Although legal trade appears to be low, there is evidence that all *Kinixys* species are collected for food, cultural purposes and the pet trade (Mifsud & Stapleton 2014). It is assumed that 20–25% of the species' habitat has been destroyed or degraded over the past 35–40 years (1.5 generations) and that this figure would reach 30–40% over the next 1.5 generations. Based on past and future habitat loss, a population reduction exceeding 30% is inferred. Improved information on the degree of habitat destruction and degradation necessitated this change from Least Concern to Vulnerable.

Taxonomic notes: No taxonomic issues, although may be confused with *K. spekii* as they are morphologically similar. *Other important names*: none.

Kinixys lobatsiana, juvenile colouration, Soutpansberg, Limpopo province (© R. van Huyssteen).

Family **Testudinidae**

Distribution: *Kinixys lobatsiana* is near-endemic to South Africa, extending from the northeastern parts of North West province eastwards through northern Gauteng province and adjacent parts of Mpumalanga province, northwards into Limpopo province, including the Soutpansberg (Broadley & Boycott 2008b; Ihlow et al. 2020). The species also occurs marginally in southeastern Botswana to the Lobatse district (type locality), but it has not been recorded from there recently. In the northern parts of its range, it overlaps with that of *K. spekii* (Ihlow et al. 2020), which confounds estimates of distribution due to potential misidentifications. *EOO*: 112 750 km^2; *Distribution*: 81 600 km^2.

Countries of occurrence: Botswana, South Africa.

Habitat and ecology: *Kinixys lobatsiana* occurs on rocky hillsides in dense and open Woodland (Broadley 1989a; Branch 2008). *Habitat*: Grassland, Savanna, Shrubland.

Threats: New information shows that there is significant habitat transformation within this species' range due to urbanisation, agriculture, mining and alien species (see Skowno et al. 2019), and this threat has been active for some decades. Frequent fires for agricultural purposes could also cause direct mortality. *Use and trade*: *Kinixys lobatsiana* is presumed to be hunted for human consumption, medicinal and cultural purposes (Mifsud and Stapleton 2014). This species is on CITES Appendix II and fewer than 200 individuals have been exported for the pet trade between 1975 and 2018 (UNEP-WCMC 2020).

Population trend: Loss and degradation of available habitat suggest significant population declines.

Conservation and research recommendations: This species is well protected in South Africa (Tolley et al. 2019a). The threats to this species are overall habitat loss, so no specific conservation actions are recommended.

Family **Testudinidae**

Kinixys natalensis Hewitt, 1935

KwaZulu-Natal Hinged-back Tortoise

Regional near-endemic

VU – Vulnerable A4c (Global)

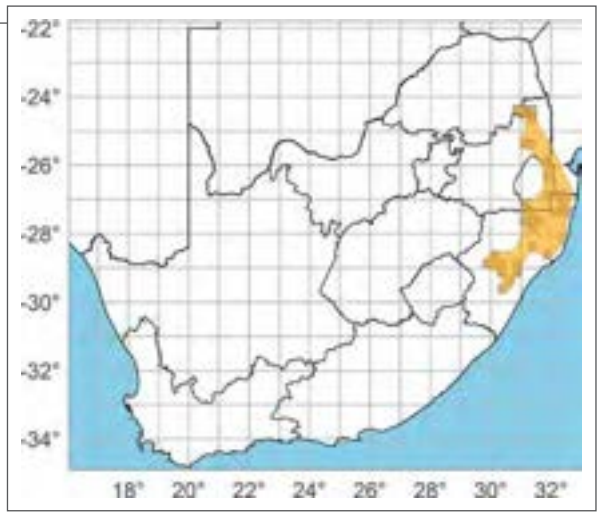
Assessors: Hofmeyr, M.D., Boycott, R.C.

Previous Red List categories:
2018: Vulnerable (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Near Threatened (Global IUCN assessment).

Reason for recent change: Genuine.

Assessment rationale: Between 30 and 40% of the species' habitat in South Africa and Eswatini has been destroyed or degraded over the past 35–40 years (1.5 generations) by agriculture, grazing and urbanisation. As these processes are likely to continue over the next 1.5 generations, the population is expected to decline in three generations by ± 40–50%.

Taxonomic notes: No taxonomic issues. *Other important names*: none.



Distribution: The range extends from central KwaZulu-Natal province, South Africa northwards into eastern Eswatini and southern Limpopo province. In Eswatini, it occurs throughout the Lebombo Mountains, and the range extends peripherally into southwestern Mozambique along these mountains (Broadley 1993; Boycott & Bourquin 2000; Rhodin et al. 2021). *EOO*: 105 000 km²; *Distribution*: 56 150 km².

Kinixys natalensis, Manyoni Private Game Reserve, KwaZulu-Natal province (© T. Ping).

Family **Testudinidae**

Kinixys natalensis, Manyoni Private Game Reserve, KwaZulu-Natal province (© T. Ping).

Countries of occurrence: Eswatini, Mozambique, South Africa.

Habitat and ecology: *Kinixys natalensis* occurs in mesic Thornveld and Bushveld, between 50 and 1 200 m a.s.l. and is generally absent from coastal regions, deep sands and forest (Boycott & Bourquin 2000; Bourquin 2004). *Habitat*: Grassland, Savanna.

Threats: The main threats are habitat loss and fragmentation due to agriculture, grazing, silviculture, dam construction and urban development (Broadley 1989b; Boycott & Bourquin 2000; Branch 2008). *Use and trade*: There is no direct evidence that this species is utilised although other *Kinixys* are harvested for food or ceremonial purposes (Mifsud & Stapleton 2014). There have been only 43 wild-caught individuals exported for the pet trade between 1994 and 2018 (UNEP-WCMC 2020).

Population trend: This species is thought to be declining as it is rare in some areas, and it is doubtful whether viable populations exist outside of protected areas (Hofmeyr & Boycott 2018).

Conservation and research recommendations: Habitat preferences should be more specifically assessed, as should the threats in different regions. In addition, research that focuses on the life history traits, reproductive biology and ecology of the species should be initiated.

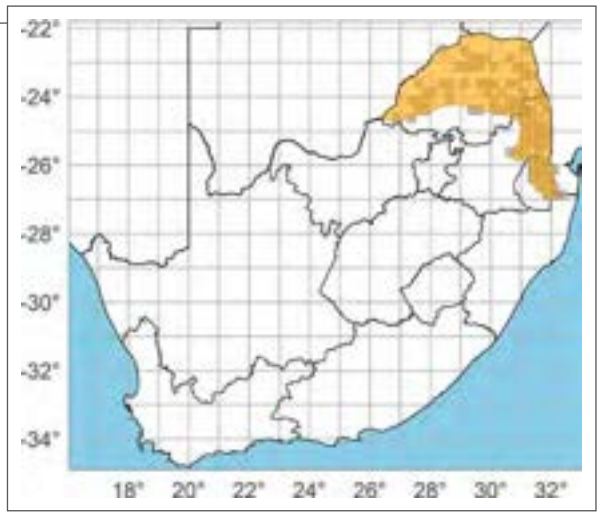
Family **Testudinidae**

Kinixys spekii Gray, 1863

Speke's Hinged Tortoise

LC – Least Concern (Regional)

Assessors: Hofmeyr, M.D., Boycott, R.C.



Previous Red List categories:
2014: Least Concern (SARCA).

Assessment rationale: Widespread in East and southern Africa, with no significant threats.

Taxonomic notes: No notable taxonomic issues, although it may be confused with *K. natalensis* (Boycott & Jacobsen 1988) and *K. lobatsiana* due to morphological similarity. *Other important names*: none.

Distribution: Widespread in tropical central, eastern and southern Africa (Boycott & Bourquin 2000), from Kenya in the north and the Democratic Republic of the Congo in the west, south to northeastern South Africa and Eswatini (Rhodin et al. 2021). Regionally, it is widespread in Limpopo province and into the subtropical Lowveld regions of Mpumalanga province (Ihlow et al. 2019) and Eswatini (Rhodin et al. 2021). It also occurs in the northernmost part of KwaZulu-Natal province (Bourquin 2004) and may extend further south along the coast (Ihlow et al. 2019). In the vicinity of the Soutpansberg and Waterberg, its range overlaps with that of *K. lobatsiana* (see Ihlow et al. 2020). Records from Gauteng and North West provinces (Bates et al. 2014; Rhodin et al. 2021) appear to be in error due to misidentifications and/or outdated taxonomy and are referable to *K. lobatsiana*. *EOO*: 240 000 km²; *Distribution*: 187 000 km².

Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: In the region, it occurs in Mixed Bushveld and Thornveld habitats (Boycott & Bourquin 2000). There is some evidence of seasonal movement into thicker Woodland in the winter

Kinixys spekii, captive specimen from unknown locality (© T. Ping).

Kinixys spekii, Dinokeng Game Reserve, Gauteng province (© G. Alexander).

Family **Testudinidae**

Kinixys spekii, Liwonde, Malawi (© D.W. Pietersen).

months (Lambiris et al. 1989). Individuals brumate during the dry season and take cover in mammalian burrows or in rock crevices (Hailey & Coulson 1995; Mifsud & Stapleton 2014). *Habitat*: Savanna, Shrubland.

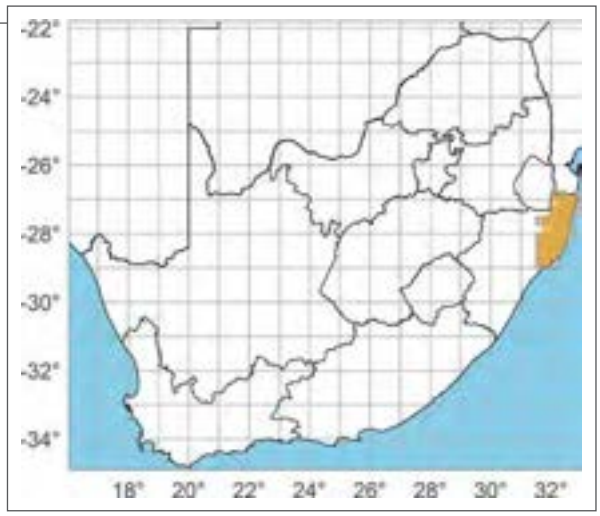
Threats: This species can be found in the traditional medicine (*muthi*) trade, pet trade and as a food source (Boycott 2001; Mifsud & Stapleton 2014; Williams et al. 2016). *Use and trade*: Between 2006 and 2018, over 8 000 *Kinixys spekii* were exported for the pet trade from across Africa (UNEP-WCMC 2020).

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Kinixys zombensis Hewitt, 1931

South-eastern Hinged-back Tortoise



LC – Least Concern (Regional)

Assessors: Hofmeyr, M.D., Boycott, R.C.

Previous Red List categories:
2014: Least Concern (SARCA).

Assessment rationale: The species has a relatively small distribution in South Africa but occurs in several protected areas. The habitat outside protected areas is severely degraded mainly due to agricultural conversion and silviculture (Schoeman et al. 2013; Jewitt et al. 2015; Skowno et al. 2019). Despite this, at least 75% of the habitat in South Africa is relatively intact.

Taxonomic notes: *Kinixys zombensis* was considered a subspecies or synonym of *K. belliana* in the past but was elevated to species status (Kindler et al. 2012). A potentially introduced population on Madagascar shows only weak genetic differentiation from South African populations (Branch 2008; Kindler et al. 2012). *Other important names*: *Kinixys belliana zombensis*; *Kinixys belliana belliana*.

Distribution: Widespread in southeastern Africa, from southern Kenya through Mozambique and southern Malawi into eastern South Africa. It is believed to have been introduced into Madagascar, perhaps historically (Broadley 1989c; Boycott & Bourquin 2000; Kindler et al. 2012). The range in South Africa is limited to KwaZulu-Natal province, from the border with Mozambique southwards to east of Eshowe. *EOO*: 19 700 km^2; *Distribution*: 18 200 km^2.

Countries of occurrence: Kenya, Malawi, Madagascar (introduced), Mozambique, South Africa, Tanzania.

Habitat and ecology: Occurs in a wide range of vegetation types ranging from dense to open grassy-shrubby Savanna and Coastal Forests. Prefers sandy areas and is absent from rocky hillsides and rocky ridges (Boycott & Bourquin 2000). *Habitat*: Forest, Savanna.

Threats: Habitat degradation has occurred over parts of the range, and this could have an effect on the population. *Use and trade*: This tortoise is consumed by humans (Broadley 1989c), but the scale of this is not known. There have been no recorded exports of this species for trade (UNEP-WCMC 2020), although this species is occasionally offered for sale in the pet trade, including wild-caught individuals.

Population trend: Although there has been a reduction in habitat quality in some parts of its range, the species is locally common, tolerates transformation of habitats to an extent and occurs in numerous protected areas. The population is thus unlikely to have declined significantly.

Conservation and research recommendations: No recommendations.

Kinixys zombensis, Caia, Mozambique (© L. Verburgt).

Family **Testudinidae**

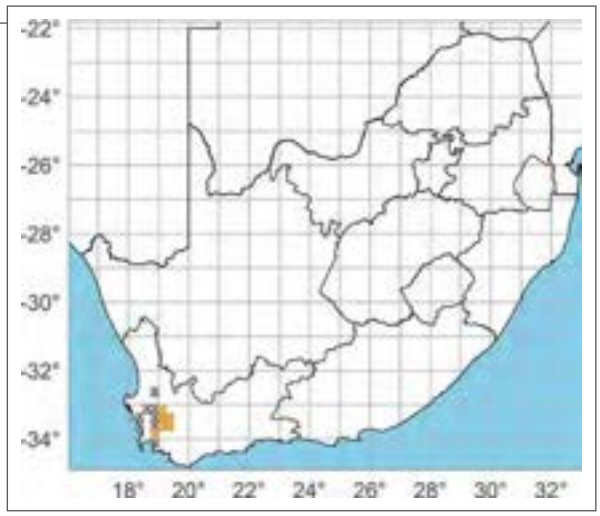
Psammobates geometricus (Linnaeus, 1758)

Geometric Tortoise

South African endemic

CR – Critically Endangered A4ace (Global)

Assessors: Hofmeyr, M.D., Baard, E.H.W.



Previous Red List categories:

2018: Critically Endangered (Global IUCN assessment).
2016: Critically Endangered (Global IUCN assessment).
2015: Critically Endangered (Global IUCN assessment).
2014: Critically Endangered (SARCA).
1996: Endangered (Global IUCN assessment).
1994: Vulnerable (Global IUCN assessment).
1990: Vulnerable (Global IUCN assessment).
1988: Vulnerable (Global IUCN assessment).
1986: Vulnerable (Global IUCN assessment).
1982: Vulnerable (Global IUCN assessment).

Assessment rationale: Past and projected future population reductions are estimated at >90%, over three generations (90 years), due to a decline in habitat quality and EOO. Increased predation from feral pigs and mortality from wildfires affect small relict subpopulations. Emerging threats are overgrazing by cattle, dense invasive vegetation that is unsuitable for tortoises and an increase in drought frequency.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: *Psammobates geometricus* has a small, severely fragmented distribution in the lower lying areas of the extreme southwestern portion of the Western Cape province, South Africa (Hofmeyr & Baard 2018). It has become locally extinct from parts of the historical range due to loss of natural habitat, which has been converted to agriculture. This has resulted in more than half of the distribution being lost and the remaining portion becoming severely fragmented. As a result, the EOO has declined by just over 70% from an original extent of 9 800 km^2 to 2 750 km^2. In the areas where the EOO has declined, the tortoise has not been

Psammobates geometricus, J.N. Briers-Louw Nature Reserve, Western Cape province (© T. Ping).

sighted for many decades. Due to the sensitive nature of the records for this species, the interpreted distribution is shown only as quarter degree grid cells. *EOO*: 2 750 km^2; *Distribution*: 399 km^2.

Country of occurrence: South Africa.

Habitat and ecology: *Psammobates geometricus* occurs in the shrubby Fynbos vegetation, mainly the Renosterveld vegetation type (Baard 1995), at elevations of 70–700 m a.s.l. It does not tolerate transformed landscapes and is confined to the small, fragmented patches of natural habitat that remain. During the hot and dry summers, individuals take refuge in slightly damp microhabitats under dense vegetation (Hofmeyr & Baard 2018). *Habitat*: Shrubland.

Threats: This species is threatened by habitat transformation due to extensive agricultural development and overgrazing, and poor habitat quality in some areas due to invasive alien plants. There is increased predation from Pied Crows (*Corvus albus*; Fincham & Lambrechts 2014) and invasive feral pigs, and wildfires are significant threats in some of the smaller habitat patches (Baard 1997). *Use and trade*: Occasional collection for local consumption occurs but this is unlikely to be a significant threat relative to the habitat loss. CITES trade statistics show that this species has not been exported for the pet trade (UNEP-WCMC 2020).

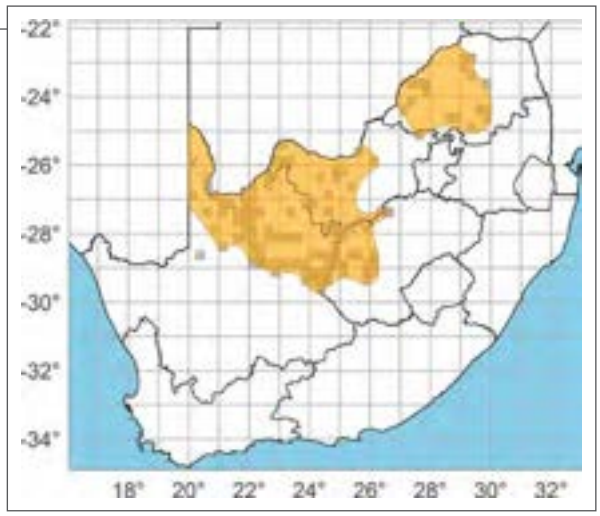
Population trend: Because more than 90% of the original habitat has been irreversibly converted to agriculture (Baard & Hofmeyr 2014), the species is in decline. Subpopulations from the western part of the original range are now extinct, with small, fragmented subpopulations occurring in the eastern extent where some original habitat still persists. Some of these small, isolated subpopulations are unlikely to be viable and some subpopulations have undergone catastrophic declines from fire-induced mortality. This is a significant threat due to the inability of these tiny local subpopulations to recover due to their presumed small population sizes and lack of connectivity as a metapopulation.

Conservation and research recommendations: Stewardship of remaining lowland habitat by landowners should be prioritised, and direct estimates of abundance over time should be made. Conservation actions should be outlined in a Biodiversity Management Plan that includes an evaluation of how to establish connectivity between the existing small habitat patches.

Family **Testudinidae**

Psammobates oculifer (Kuhl, 1820)

Serrated Tent Tortoise,
Kalahari Tent Tortoise



LC – Least Concern (Regional)

Assessors: Hofmeyr, M.D., Keswick, T.

Previous Red List categories:
2014: Least Concern (SARCA).

Assessment rationale: Although this species occurs at low abundance, it is widespread with no substantial threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs throughout much of the Kalahari region of South Africa, Botswana and Namibia. Regionally, it is distributed in the northern and central arid regions. The apparently disjunct population in the northeast of the region is continuous with the remainder of the population through Botswana. There is a record from Augrabies Falls that is disjunct from the main range and which requires confirmation. *EOO*: 540 000 km^2; *Distribution*: 266 000 km^2.

Countries of occurrence: Botswana, Namibia, South Africa, Zimbabwe.

Habitat and ecology: *Psammobates oculifer* occurs in semi-arid to arid regions on the central plateau of southern Africa, at elevations of 800–1 500 m a.s.l., primarily in grassy Woodlands, but also in Nama-Karoo. *Habitat*: Savanna, Shrubland.

Threats: Habitat degradation in the northeast may contribute to declines in that area. *Use and trade*: Decorated shells are illegally sold as containers to tourists in Namibia and Botswana (Bonin et al. 2006) and it is sold in some Asian markets (Cheung & Dudgeon 2006).

Population trend: Because this tortoise is widespread in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: No recommendations.

Psammobates oculifer, Groblershoop, Northern Cape province (© D.W. Pietersen).

Psammobates oculifer, near Langjan, Limpopo province (© R. van Huyssteen).

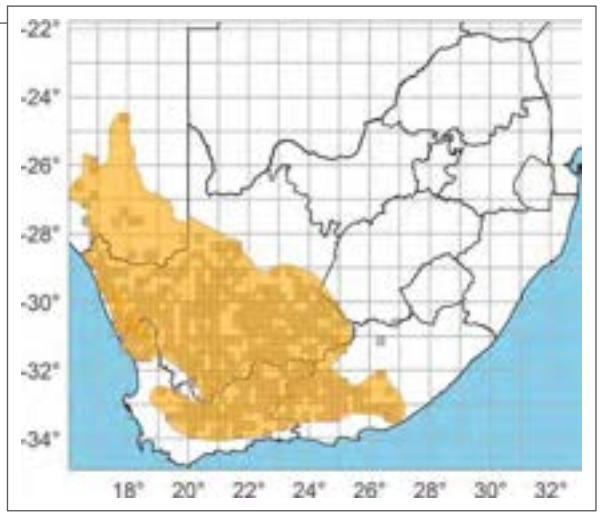
Family **Testudinidae**

Psammobates tentorius (Bell, 1828)

Tent Tortoise

NT – Near Threatened A4ce (Global)

Assessors: Hofmeyr, M.D., Leuteritz, T., Baard, E.H.W.



Previous Red List categories:
2018: Near Threatened (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Reason for recent change: Genuine.

Subspecies included under this assessment:
- *Psammobates tentorius tentorius* (Bell, 1828).
- *Psammobates tentorius trimeni* (Boulenger, 1886).
- *Psammobates tentorius verroxii* (Smith, 1839).

Assessment rationale: *Psammobates tentorius* is widespread and relatively common, but populations are scattered, and some appear to have declined by approximately 10–20% over three generations. There is moderate degradation in the northern part of the range from overgrazing and mining, and there is an increase in predation from the invasive Pied Crow (*Corvus albus*).

Taxonomic notes: There has been confusion regarding the taxonomic status of the subspecies (*P. t. tentorius*, *P. t. trimeni* and *P. t. verroxii*) due to considerable colour and morphological variation and partially sympatric ranges. A recent phylogenetic study of southern African tortoise radiations indicates that *P. tentorius* consists of four to six deeply divergent lineages (Hofmeyr et al. 2017; Zhao et al. 2020), suggesting a taxonomic revision is required. *Other important names*: none.

Distribution: *Psammobates tentorius* has a wide distribution across western South Africa and southwestern Namibia (Griffin 2003; Hofmeyr et al. 2018b). In South Africa, the largest proportion of the distribution lies in the semi-arid to arid regions above the Great Escarpment, although the distribution extends southwards into parts of the Cape Fold Mountains. *EOO*: 626 300 km^2; *Distribution*: 480 500 km^2.

Psammobates tentorius tentorius, Matjiesfontein, Western Cape province (© C. & S. Dorse).

Psammobates tentorius tentorius, Kamieskroon, Northern Cape province (© C. & S. Dorse).

Family **Testudinidae**

Psammobates tentorius verroxi, Aggeneys, Northern Cape province (© T. Ping).

Psammobates tentorius trimeni, Zandkopsdrift, Northern Cape province (© M. Burger).

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in arid regions from sea level to at least 1 500 m a.s.l. *Habitat*: Shrubland.

Threats: Known threats include road mortality, veld fires, electrocution by livestock/game fences and overgrazing from domestic livestock (Cunningham & Strauss 2005; Cunningham 2006). Pied Crow (*Corvus albus*) predation on this taxon appears to be significant (Hofmeyr et al. 2018b). *Use and trade*: Since 1989, just over 200 individuals have been exported for the pet trade, with 70% of these reported as captive bred (UNEP-WCMC 2020).

Population trend: Population density is relatively low throughout its range (Branch 2008) and populations appear to be slowly declining.

Conservation and research recommendations: The taxonomic status of the subspecies needs clarification.

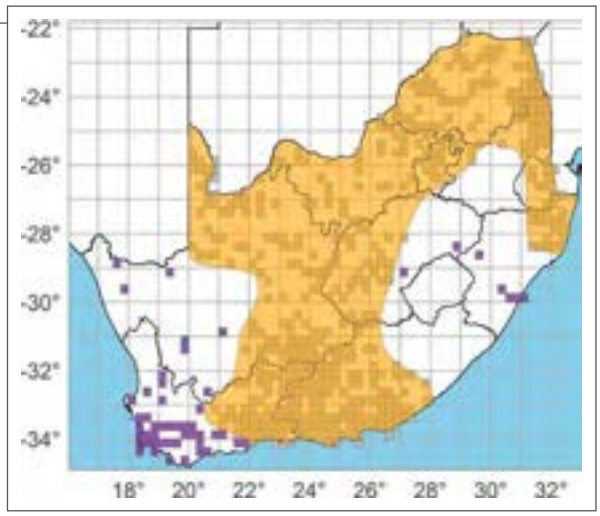
Family **Testudinidae**

Stigmochelys pardalis (Bell, 1828)

Leopard Tortoise

LC – Least Concern (Regional)

Assessors: Hofmeyr, M.D., Baard, E.H.W.



Previous Red List categories:
2015: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant with no significant threats.

Taxonomic notes: The recognition of two subspecies, *S. p. babcocki* (Loveridge, 1935) and *S. p. pardalis* (Bell, 1828), remains contentious (see Le et al. 2006; Fritz et al. 2010). *Other important names*: *Geochelone pardalis*.

Distribution: Occurs widely through the Savanna and scrubland of East and southern Africa. Widespread in South Africa and Eswatini, from Limpopo province southwards through the central parts of South Africa, into the eastern Karoo extending to the coastal regions (see also Rhodin et al. 2021). It appears to be excluded from large areas in eastern South Africa, as well as the most arid western regions. The original range may have been smaller, as their occurrence in areas such as Cape Town, Johannesburg, Gqeberha and other urban centres are likely to have been the result of multiple introductions. The best estimate of the historical range has been mapped

Stigmochelys pardalis, Rooipoort Nature Reserve, Northern Cape province (© K.A. Tolley).

Family **Testudinidae**

Stigmochelys pardalis, Blouberg, Limpopo province (© R.I. Stander).

as the interpreted distribution, with purple grid cells showing areas that are likely to represent human-assisted introductions and range expansions. Where these extralimital subpopulations are continuous with the historical range, they are considered naturalised, viable subpopulations, so they have been included in the estimate of EOO. *EOO*: 1 500 000 km^2; *Distribution*: 840 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Rwanda, Somalia, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs across a wide range of different habitats and vegetation types, from sea level to over 1 500 m a.s.l. elevation. Most of the range in South Africa has sweet, palatable grasses (Kruger et al. 2006), which may explain the absence of the species in the eastern parts of South Africa, where sour grasses dominate. *Habitat*: Grassland, Savanna, Shrubland.

Threats: Individuals are frequently electrocuted on electrified fencing, which can have serious impacts in some areas (Burger & Branch 1994) with tens of thousands of individuals killed annually (Beck 2009; Lee et al. 2021). *Use and trade*: potential threats include pet trade and the traditional medicine (*muthi*) trade (Williams et al. 2016). This is a heavily traded species globally, with nearly 200 000 wild-caught and more than 400 000 captive bred individuals having been traded under CITES permits between 1975 and 2019 (UNEP-WCMC 2020). The purpose for the majority of this trade was recorded by CITES as pet trade. The proportion of CITES trade originating from the region, however, is minor (± 2%). Large numbers of individuals are, however, removed from the wild and/or traded within the region (Ban Animal Trading & EMS Foundation 2020).

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with portions of the range that are not significantly impacted by habitat transformation. Abundance appears to be higher in mesic areas (McMaster & Downs 2006).

Conservation and research recommendations: Finding mitigation measures to reduce, and ideally prevent, the accidental electrocution of individuals on electrified fencing would be hugely beneficial. Recommendations include raising the minimum height of the electrified wire strands, switching off electrified fences during parts of the day when tortoises are most active, or placing rock barriers against the fences to direct animals away (Beck 2009; Pietersen et al. 2014; Lee et al. 2021).

3.3
Squamates
(lizards)

Ptenopus garrulus garrulus (© C. Keates).

Family **Gekkonidae**

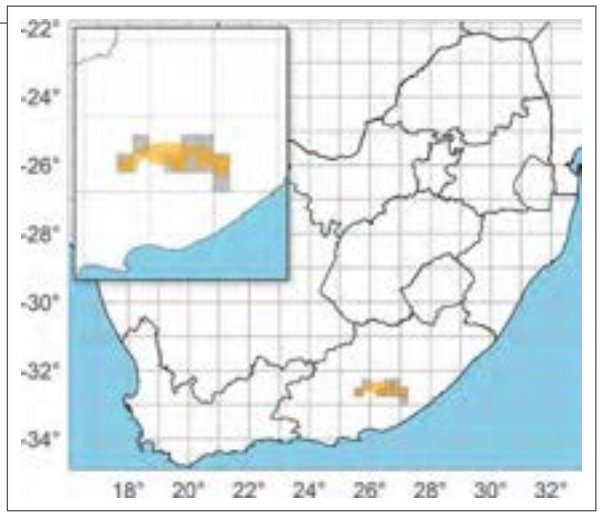
Afroedura amatolica (Hewitt, 1925)

Amatola Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a relatively small distribution, but it is abundant, and the habitat is relatively intact.

Taxonomic notes: Phylogenetic analyses suggest that there could be cryptic species within the *A. amatolica* complex (Makhubo et al. 2015). *Other important names*: none.

Distribution: Distributed in high, mountainous areas of the Winterberg and Amathole mountain ranges of the Eastern Cape province, South Africa. *EOO*: 6 000 km^2; *Distribution*: 4 100 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Rupicolous; occurring in mesic rocky habitats in Montane Grassland at elevations of 1 400–1 830 m a.s.l. *Habitat*: Grassland.

Threats: There are no significant threats to this species.

Population trend: The population is suspected to be stable as the rupicolous habitat of this gecko has not been significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Afroedura amatolica, Vern Glen, Eastern Cape province (© W. Conradie).

Afroedura amatolica, Hogsback, Eastern Cape province (© W. Conradie).

Family **Gekkonidae**

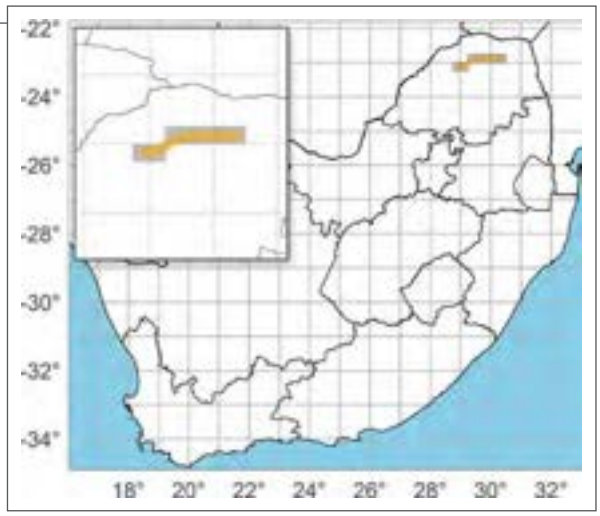
Afroedura broadleyi Jacobsen, Kuhn, Jackman & Bauer, 2014

Broadley's Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: This species has a moderate-sized range in mountainous terrain in which there is relatively little habitat transformation, and there are no other significant threats.

Taxonomic notes: No outstanding taxonomic issues. However, the name '*Afroedura soutpansbergensis*' was mentioned in error in Jacobsen et al. (2014) on several occasions in reference to *A. broadleyi*. *Other important names*: *Afroedura langi* 'Soutpansberg'; *Afroedura langi* 'Matlala'.

Distribution: This species occurs as three isolated subpopulations on the Soutpansberg, Blouberg and Matlala inselbergs, Limpopo province, South Africa. *EOO*: 3 700 km^2; *Distribution*: 2 500 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species can be found in rock crevices and fissures and under rock flakes on Waterberg sandstone outcrops in Bushveld Savanna and Sourveld Grassland at elevations of 1 000–1 700 m a.s.l. (Jacobsen et al. 2014). *Habitat*: Grassland, Savanna.

Threats: There are no major threats.

Population trend: The population is suspected to be stable as the rupicolous habitat of this gecko has not been impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

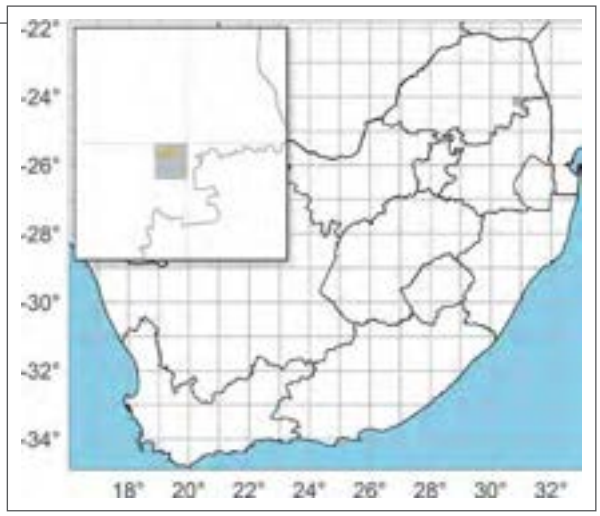
Afroedura broadleyi, Matlala, Limpopo province (© R.I. Stander).

Afroedura broadleyi, Blouberg, Limpopo province (© L. Verburgt).

Family **Gekkonidae**

Afroedura granitica Jacobsen, Kuhn, Jackman & Bauer, 2014

Granite Flat Gecko



South African endemic

LC – Least Concern (Global)

Assessors: Pietersen, D.W., Conradie, W., Tolley, K.A., Alexander, G.J., Weeber, J.

Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).

Assessment rationale: Although this species has a very small distribution, it is well protected and there are no substantial threats.

Taxonomic notes: No current taxonomic issues, but see Jacobsen (1989, 1992) for historic taxonomic context. *Other important names*: *Afroedura langi* 'Lillie'.

Distribution: Occurs in the mountainous area in Selati Nature Reserve in Limpopo province, South Africa, approximately 30 km southwest of Phalaborwa. Although previously only recorded from Lillie Cycad Reserve, recent records show that it is more widespread. *EOO*: 58 km²; *Distribution*: 51 km².

Country of occurrence: South Africa.

Habitat and ecology: This gecko occurs on granite outcrops and hillsides in Lowveld Savanna vegetation at elevations of 600–800 m a.s.l. Shelters in rock crevices and under exfoliated rock flakes (Jacobsen et al. 2014). *Habitat*: Savanna.

Threats: Occurs within a well-protected and well-managed nature reserve, and there are no plausible threats to this species.

Population trend: This species occurs in a well-protected nature reserve and there are no threats, and the population is therefore inferred to be stable.

Conservation and research recommendations: More comprehensive information on the distribution is needed to better estimate its full range.

Afroedura granitica, Selati Nature Reserve, Limpopo province (© S. Nielsen).

Afroedura haackei Onderstall, 1984

Haacke's Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:

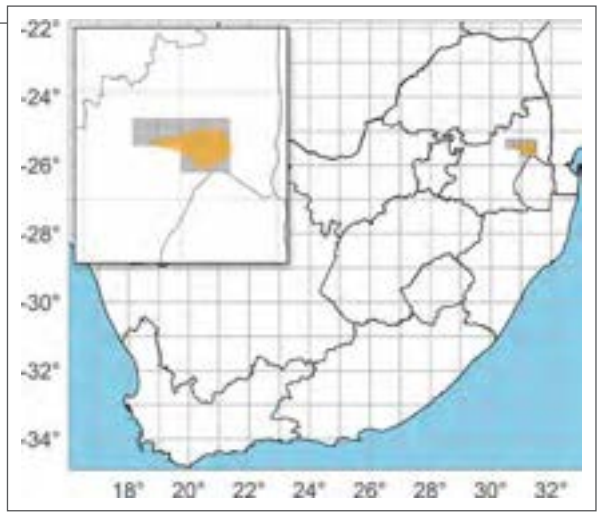
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Afroedura multiporis haackei*.

Assessment rationale: Has a small range but is locally abundant with relatively little habitat loss within its range. It also occurs within several protected areas.

Taxonomic notes: No taxonomic issues. *Other important names*: *Afroedura multiporis haackei*.

Distribution: Occurs in northeast Mpumalanga province, South Africa (Jacobsen et al. 2014), from Nelspruit to Krokodilpoort Mountains. A single specimen from Ditsong National Museum of Natural History (TM 49920; as *Afroedura transvaalica*, see photograph in Pienaar et al. 1983) from Farm Scrutton 23MT, which is approximately 50 km to the east of other records, may be referable to this species (Jacobsen et al. 2014), but this requires confirmation. *EOO*: 2 000 km^2; *Distribution*: 1 850 km^2.

Country of occurrence: South Africa.



Habitat and ecology: Hides in cracks on granite boulders in well-wooded Lowveld Savanna and on buildings offering similar microhabitats. Occurs at elevations of 500–1 100 m a.s.l. (Jacobsen 1989). *Habitat*: Savanna.

Threats: May be locally affected by grazing, burning and woodcutting in the future as these activities remove trees typical of the habitat (Jacobsen 1989).

Population trend: Reported to be locally abundant (Jacobsen 1989). Given that there are relatively few threats to its habitat, the population is inferred to be stable and not severely fragmented.

Conservation and research recommendations: No recommendations.

Afroedura haackei, about 30 km west of Mbombela, Mpumalanga province (© M. Burger).

Family **Gekkonidae**

Afroedura halli (Hewitt, 1935)

Hall's Flat Gecko

Regional endemic

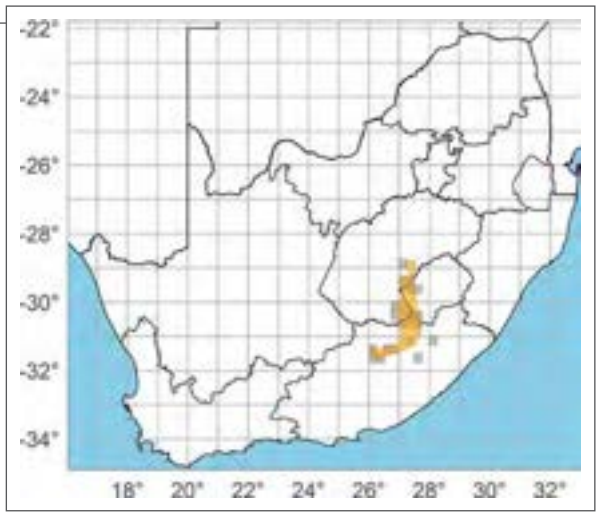
LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a moderate-sized and naturally patchy distribution across isolated montane regions that are largely inaccessible. Most of the habitat is intact and there are no major threats.

Taxonomic notes: The taxonomy of the *A. nivaria* species complex, which includes *A. halli*, requires revision, as a phylogenetic analysis suggests that there are cryptic species (Makhubo et al. 2015). A population in the southeastern Free State province referred to *A. nivaria* by De Waal (1978) was assigned to *A. halli* by Bates (1996a), and this population and two more in the area were confirmed to be *A. halli* by Makhubo et al. (2015). Another population from an inselberg in the eastern Free State province previously assigned to *A. nivaria* (De Waal 1978; Branch 1998; Bates & Bauer 2018) was shown (together with additional nearby isolated populations) to be more closely related to *A. halli* (Makhubo et al. 2015). *Other important names*: none.



Distribution: Occurs on isolated outcrops and mountain tops and in parts of the southwestern Drakensberg of South Africa and Lesotho, extending southwards into parts of the Eastern Cape province (Bates 1989, 1996a,b). There are several outlying records to the southeast of the main interpreted distribution. The population in the northwest Drakensberg is currently assigned to this species but could potentially be a cryptic taxon (Makhubo et al. 2015). *EOO*: 41 000 km^2; *Distribution*: 15 000 km^2.

Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: Occurs on sandstone cliffs and boulders at or near the summits of mountains and outcrops (1 750–2 200 m a.s.l.), where it shelters in narrow crevices (Bates 1996a). *Habitat*: Grassland.

Threats: There are no major threats to this species.

Population trend: The population size is thought to be stable as the rupicolous habitat of this gecko has not been impacted by habitat transformation.

Conservation and research recommendations: Investigation into the taxonomic status of potentially cryptic species is needed.

Afroedura halli, Steynsburg, Eastern Cape province (© L. Kemp).

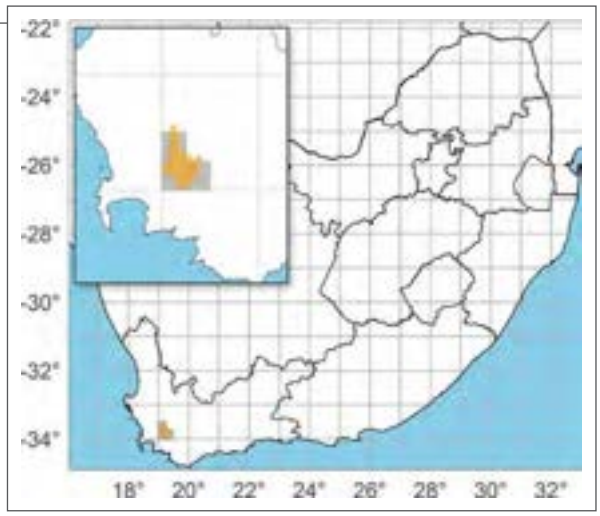
Afroedura hawequensis Mouton & Mostert, 1985

Hawequa Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a small distribution but is locally abundant within several protected areas, with no continuing declines in habitat or population fluctuations. Previously assessed as Near Threatened in 2017 due to threats from regular fires, having a restricted range, and occurring at five locations. However, as this gecko evolved in a fire-prone habitat, and there have been no significant changes in the natural fire regime, this threat is not considered significant. In addition, threat-defined locations do not apply because there is no single, plausible threatening event that can rapidly affect all individuals in a short time frame.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: This species is endemic to the Du Toitskloof and Limietberg mountains in the southwestern portion of the Western Cape province, South Africa. *EOO*: 1 400 km^2; *Distribution*: 1 000 km^2.

Afroedura hawequensis, Du Toitskloof, Western Cape province (© T. Busschau).

Afroedura hawequensis, Limietberg, Western Cape province (© L. Kemp).

Family **Gekkonidae**

Afroedura hawequensis, Mount Rochelle, Western Cape province (© L. Kemp).

Country of occurrence: South Africa.

Habitat and ecology: Occurs in mesic habitats on sandstone boulders and outcrops at elevations of 1 100–1 400 m a.s.l. (Mouton & Mostert 1985). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The species is not considered to be in decline given that it occurs in a mountainous area that is essentially unaffected by habitat transformation. Mouton and Mostert (1985) and Mouton (1988) indicated that densities were high.

Conservation and research recommendations: No recommendations.

Afroedura karroica (Hewitt, 1925)

Karoo Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.

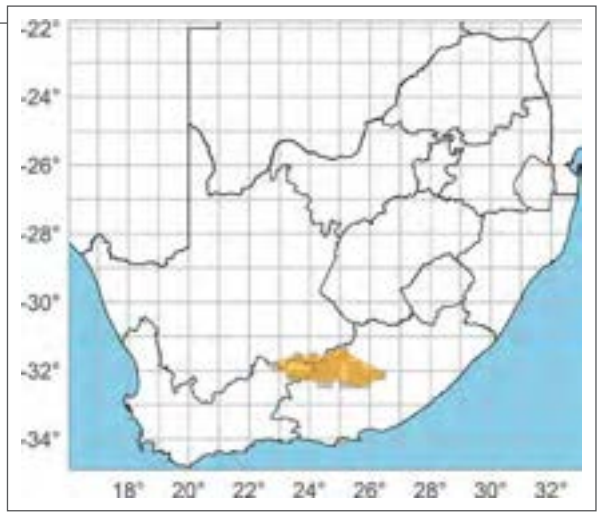
Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is relatively widespread, occurring in a number of protected areas, and is not subject to any major threats. Habitat loss is minimal within its range.

Taxonomic notes: The taxonomy of the *A. karroica* complex requires revision, as a phylogenetic analysis suggests that there are undescribed, cryptic species (Makhubo et al. 2015). *Other important names*: none.

Distribution: Occurs in east-central South Africa, from the central Eastern Cape province into adjacent regions of the Northern Cape and northeastern Western Cape provinces. *EOO*: 26 500 km²; *Distribution*: 24 000 km².

Country of occurrence: South Africa.



Habitat and ecology: Occurs in rocky habitats, chiefly in Grasslands (Branch 1998) but also in Nama-Karoo vegetation at elevations of 1 300–2 200 m a.s.l. *Habitat*: Grassland, Shrubland.

Threats: There are no major threats to this species.

Population trend: The population size is thought to be stable as the rupicolous habitat of this gecko has not been impacted by habitat transformation.

Conservation and research recommendations: Investigation into the taxonomic status of the potential cryptic species is needed.

Afroedura karroica, Nieu-Bethesda, Eastern Cape province (© L. Kemp).

Afroedura karroica, Nieu-Bethesda, Eastern Cape province (© T. Ping).

Family **Gekkonidae**

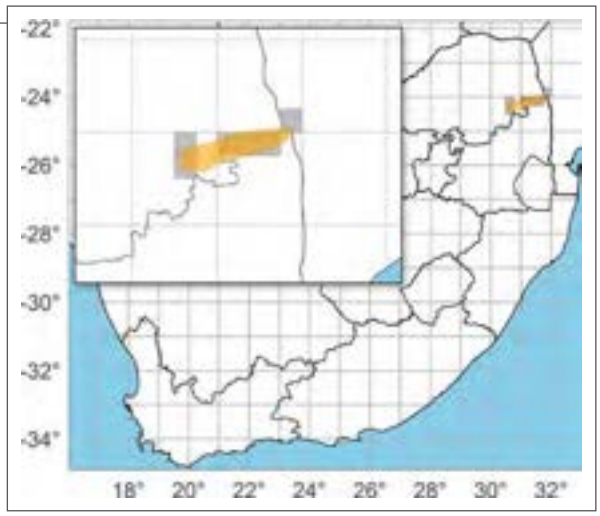
Afroedura langi (FitzSimons, 1930)

Lang's Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although this species has a small distribution, most of the habitat is intact and nearly 25% of its range is within protected areas. It is also tolerant of, and sometimes utilises, anthropogenic structures.

Taxonomic notes: *Afroedura langi* originally contained several undescribed species (Jacobsen 1989, 1992a), but with a taxonomic revision and the description of six new species (Jacobsen et al. 2014), there are no other taxonomic issues. *Other important names*: *Afroedura pondolia langi*.

Distribution: Occurs in the Olifants River Valley in northeastern South Africa, from southeastern Limpopo province into northeastern Mpumalanga province (Jacobsen 1989). Although previously mapped as occurring in adjacent southwestern Mozambique (Visser 1984a), this was in error as the record is from Lydenburg District, South Africa. This error has been repeated in later literature. *EOO*: 3 600 km^2; *Distribution*: 3 400 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species occurs in Lowveld Savanna at elevations of 180–500 m a.s.l., where it uses crevices in rock outcrops (Jacobsen 1989). *Habitat*: Savanna.

Threats: There are no major threats.

Population trend: The population size is thought to be stable as the rupicolous habitat of this lizard has not been impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Afroedura langi, Belule, Limpopo province (© L. Kemp).

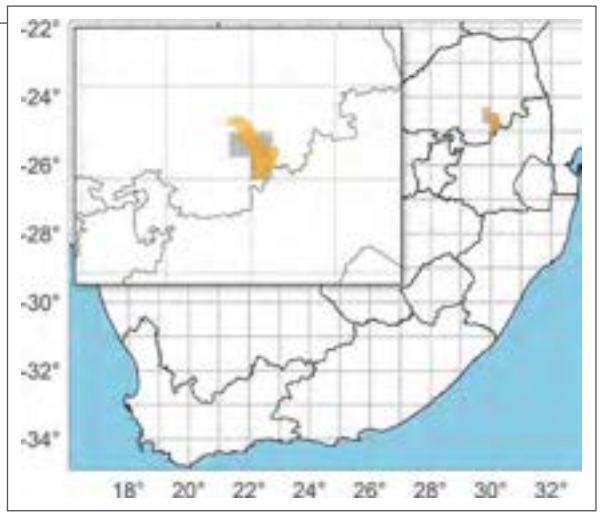
Afroedura leoloensis Jacobsen, Kuhn, Jackman & Bauer, 2014

Leolo Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: Has a restricted distribution in an area with some habitat loss, and the species is not known from any protected areas. However, more than half of the distribution has intact habitat, and the species inhabits rock outcrops, which are not prone to destruction. These factors suggest that it should be able to persist despite the habitat transformation.

Taxonomic notes: No current taxonomic issues, but see Jacobsen (1989, 1992) for historic taxonomic context. *Other important names*: *Afroedura langi* 'Leolo'.

Distribution: This species occurs in the Leolo Hills and the outcrops above the Steelpoort River near the border of Mpumalanga and Limpopo provinces, South Africa (Jacobsen et al. 2014). *EOO*: 2 400 km^2; *Distribution*: 1 800 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This is a rupicolous species that uses noritic and granitic formations, sheltering under exfoliations and in narrow rock crevices at an elevation range of 1 200–1 800 m a.s.l. (Jacobsen et al. 2014). *Habitat*: Grassland, Savanna.

Threats: Some of the surrounding habitat has been modified due to mining activities. There are several active mines and additional proposed mines in the area, but the local impact of this on *A. leoloensis* is not known. Despite this, most of the habitat is intact.

Population trend: The extent of habitat transformation is small in relation to the overall range of this species. Although there could be some local population declines, this is unlikely to pose a threat to the species.

Conservation and research recommendations: No recommendations.

Afroedura leoloensis, Steelpoort region, Limpopo province (© G.K. Nicolau).

Family **Gekkonidae**

Afroedura major Onderstall, 1984

Swazi Flat Gecko

Eswatini endemic

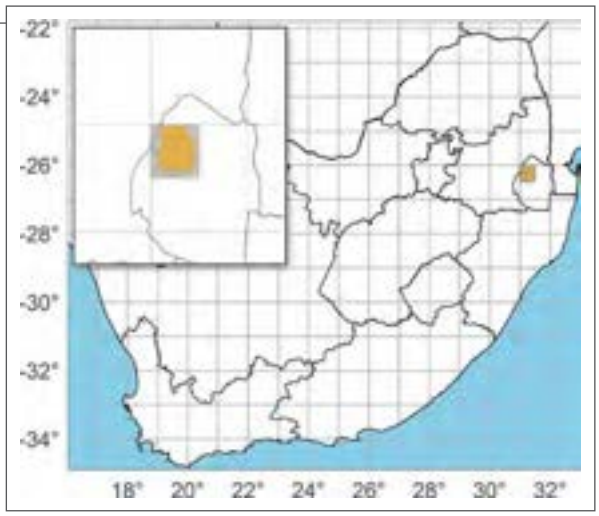
LC – Least Concern (Global)

Assessors: Bates, M.F., Boycott, R.C., Verburgt, L., Pietersen, D.W., Farooq, H.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2015: Near Threatened (SARCA).
2013: Near Threatened (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a moderate distribution and some habitat has been lost in the past due to the construction of dams. However, the habitat loss is minimal in comparison to the entire range and future habitat loss is believed to be negligible; it also occurs in at least two nature reserves. There are no additional threats to this species and it can be locally common. Previously assessed as Near Threatened in 2017 due to reduction in population size as a result of habitat loss from construction of a large dam. However, examination of satellite imagery shows that the loss of habitat due to this dam is negligible in the context of the global range.



Taxonomic notes: No taxonomic issues. *Other important names*: *Afroedura pondolia major*.

Distribution: Endemic to the higher-lying regions of northwestern Eswatini. *EOO*: 1 600 km^2; *Distribution*: 1 500 km^2.

Country of occurrence: Eswatini.

Habitat and ecology: Occurs in mountainous terrain between 500 and 1 300 m a.s.l. elevation, where it favours horizontal cracks and overhanging rock ledges along medium and large rivers, and semi-dark caves in boulder outcrops away from rivers (Monadjem et al. 2003). *Habitat*: Grassland, Savanna.

Threats: Although part of this species' range was lost with the construction of the Maguga Dam, this is minimal with respect to the overall distribution. No further dams have been proposed for the river basins in which the species occurs and future threats are unlikely.

Population trend: Part of the historical population was lost with the construction of the Maguga Dam. The remainder of the population is inferred to be stable as there are no additional plausible threats to this species.

Conservation and research recommendations: No recommendations.

Afroedura major, Eswatini (© F. Colaciccio).

Family **Gekkonidae**

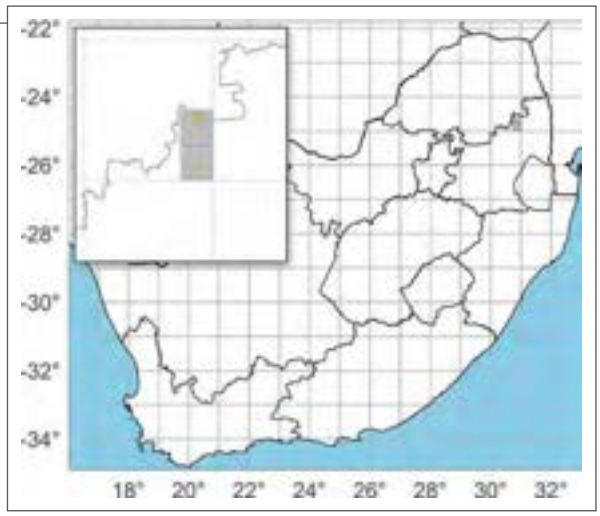
Afroedura maripi Jacobsen, Kuhn, Jackman & Bauer, 2014

Mariepskop Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: Although this species has a small range, there are no significant threats. Part of its distribution is within areas that have transformed habitat, but much of the distribution is within protected areas.

Taxonomic notes: No current taxonomic issues, but see Jacobsen (1989, 1992) for historic taxonomic context. *Other important names*: *Afroedura* 'maripi'.

Distribution: This species has been recorded from the slopes and summit of Mariepskop and in the God's Window area along the Great Escarpment in Mpumalanga province, South Africa (Jacobsen et al. 2014). *EOO*: 293 km^2; *Distribution*: 69 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Shelters in rock crevices and exfoliations, often on partly shaded rocky outcrops, in Montane Heathland (Jacobsen et al. 2014) at elevations of 1 700–1 900 m a.s.l. Also occurs on manufactured structures. *Habitat*: Shrubland.

Population trend: Because much of the geographic range of this species is in protected areas, the population size is assumed to be stable.

Threats: Although this species has a relatively small range, there are currently no significant threats. Most of the range falls in a protected area (Blyde River Canyon Nature Reserve). Outside this protected area, the landscape is heavily transformed.

Conservation and research recommendations: The habitat in its small range should be monitored for additional degradation outside protected areas.

Afroedura maripi, Mariepskop, Mpumalanga province (© D.W. Pietersen).

Afroedura maripi, Mariepskop, Mpumalanga province (© G.K. Nicolau).

Family **Gekkonidae**

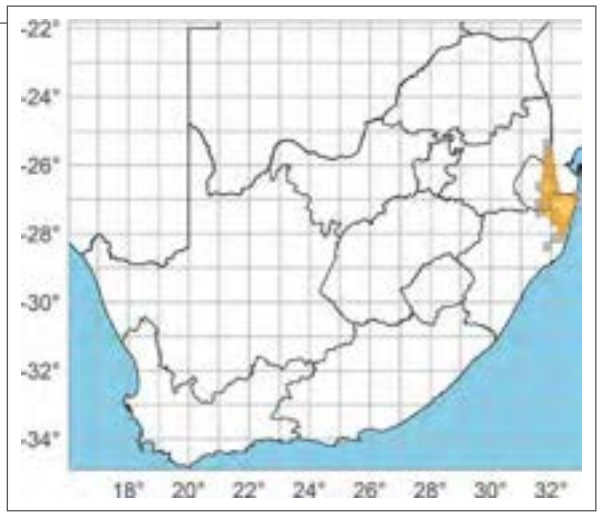
Afroedura marleyi (FitzSimons, 1930)

Marley's Flat Gecko

Regional near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is relatively widespread and common. Although there is some habitat alteration within its range, there are no major threats, and it is considered to be well protected.

Taxonomic notes: Previously considered a subspecies of *A. pondolia* (e.g., Onderstall 1984), Branch (1998) elevated it to a full species without comment. The specific status of *A. marleyi* has subsequently been confirmed in a phylogenetic framework (Jacobsen et al. 2014). Although *A. pondolia* and *A. marleyi* are clearly distinct species (Jacobsen et al. 2014), they are morphologically similar, and this may result in misidentification of specimens from coastal KwaZulu-Natal province. *Other important names*: *Afroedura pondolia marleyi*.

Distribution: Occurs in northeastern South Africa from coastal KwaZulu-Natal province, northwards along the Lebombo Mountains through Eswatini to southeastern Mpumalanga province (Jacobsen et al. 2014). Recent records confirm that this gecko also occurs in southern Mozambique. *EOO*: 21 500 km^2; *Distribution*: 16 350 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa.

Habitat and ecology: Occurs in mesic habitats from Coastal Forests to Savanna, from sea level to 700 m a.s.l. elevation (Jacobsen 1989; Bourquin 2004). *Habitat*: Forest, Savanna.

Threats: There are no significant threats.

Population trend: The population size is thought to be stable as the rupicolous habitat of this gecko has not been impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Afroedura marleyi, Lebombo Mountains, KwaZulu-Natal province (© D. van Eyssen).

Afroedura multiporis (Hewitt, 1925)

Woodbush Flat Gecko

South African endemic

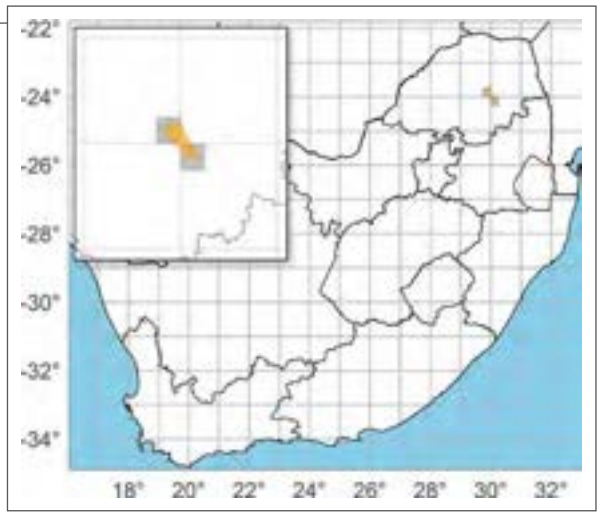
NT – Near Threatened B1b(i,iii) (Global)

Assessors: Tolley, K.A., Weeber, J., Bates, M.F., Bauer, A.M.

Previous Red List categories:
2018: Near Threatened (Global IUCN assessment).

Assessment rationale: This species has a small range of which more than half is heavily transformed and the EOO has marginally declined from the estimated historical distribution. Much of the remaining distribution, however, is within protected areas and the species cannot be considered severely fragmented as there are a number of large habitat patches remaining. However, given the heavy land transformation in the majority of its range and the inferred decline in EOO, this species is assessed as Near Threatened.

Taxonomic notes: No taxonomic issues. *Other important names*: *Afroedura pondolia multiporis*; *Afroedura multiporis*.



Distribution: Occurs in the mountainous areas around Haenertsburg and Wolkberg in southern Limpopo province, South Africa (Jacobsen et al. 2014). *EOO*: 650 km^2; *Distribution*: 218 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on granite and quartzite cliffs and boulders, at elevations of 1 400–1 800 m a.s.l. (Jacobsen 1989). *Habitat*: Forest, Grassland, Savanna.

Afroedura multiporis, Iron Crown, Limpopo province (© L. Kemp).

Family **Gekkonidae**

Afroedura multiporis, Haenertsburg, Limpopo province (© G.K. Nicolau).

Threats: Much of the small range has been heavily transformed through afforestation (Jacobsen 1988a), and the construction of the Ebenezer Dam impacted a portion of the range (Onderstall 1984). Comparison of original vegetation extent at 2 000 m a.s.l. (with a lower buffer from about 1 200 m a.s.l.) with the South African national land cover maps from 1990 and 2013 (Geo Terra Image 2015, 2016) shows that about half the historical distribution has been lost, with much of the remaining range reduced to habitat fragments. It is unlikely that the species can disperse between the remaining fragments, possibly disrupting metapopulation processes. However, it is not considered severely fragmented because more than 50% of the total population is in habitat patches that can support viable populations.

Population trend: The population is likely to be in decline given the heavy habitat transformation within its range and the decline in EOO. However, it cannot be considered severely fragmented as there are a number of large habitat patches remaining, and much of the distribution is within protected areas.

Conservation and research recommendations: Half of the range falls within protected areas (Tolley et al. 2019a), but improved knowledge of the extent of the threat posed by existing forestry practice is needed. It would be useful to assess isolated habitat fragments to evaluate connectivity and gene flow between them.

Family **Gekkonidae**

Afroedura namaquensis (FitzSimons, 1938)

Namaqua Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: Least Concern (SARCA) as *Afroedura africana namaquensis*.

Assessment rationale: Has a small distribution, but there is essentially no reduction in extent or quality of habitat within its range.

Taxonomic notes: No issues. *Other important names*: *Afroedura africana namaquensis*.

Distribution: Occurs in the Little Namaqualand region of western South Africa in the western part of the Northern Cape province, South Africa (Jacobsen et al. 2014), and it has recently been recorded as far north as the Richtersveld region (Van Huyssteen & Petford 2021). *EOO*: 2 250 km^2; *Distribution*: 960 km^2.

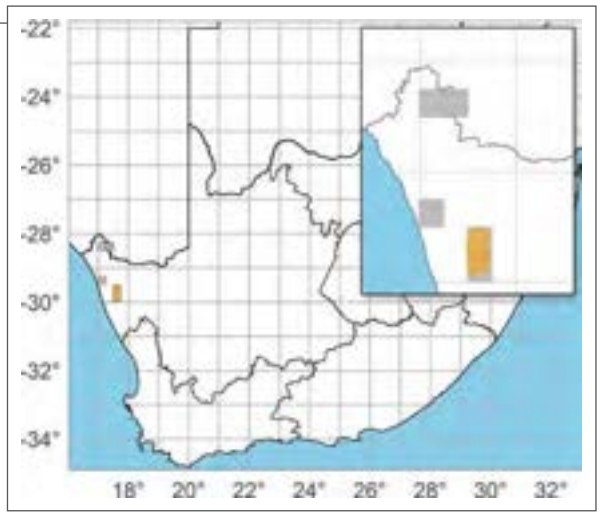
Country of occurrence: South Africa.

Habitat and ecology: Rupicolous, occurs in association with exfoliating granite boulders at elevations of 100–1 500 m a.s.l. in the Succulent Karoo biome (Jacobsen et al. 2014). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population size is thought to be stable and not fragmented given that its habitat is essentially intact.

Conservation and research recommendations: No recommendations.



Afroedura namaquensis, Springbok, Northern Cape province (© C. & S. Dorse).

Afroedura namaquensis, Nigramoep, Northern Cape province (© M. Petford).

Family **Gekkonidae**

Afroedura nivaria (Boulenger, 1894)

Drakensberg Flat Gecko

South African endemic

LC – Least Concern (Global)

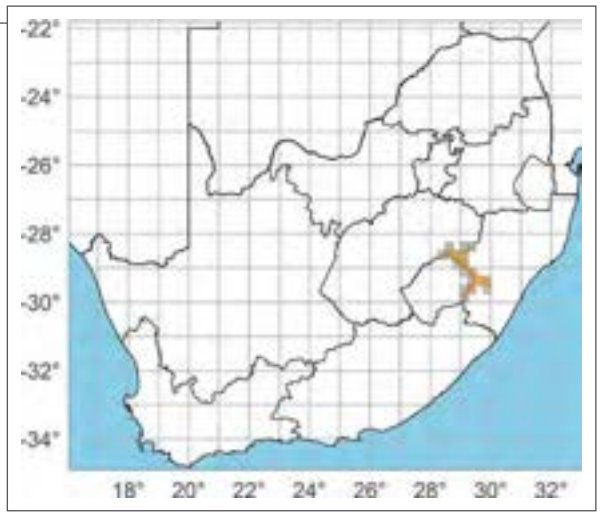
Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Although there are a few isolated subpopulations, this species is fairly widespread and locally abundant in a mountainous area that is not threatened by anthropogenic activities.

Taxonomic notes: The *A. nivaria* species complex requires revision as at least two cryptic species within *A. nivaria* have been proposed (Makhubo et al. 2015). There is a possible zone of sympatry between *A. nivaria* and *A. pondolia* in the foothills of the Drakensberg that might be due to misidentified specimens. Records from the western Drakensberg (Free State province) that were previously assigned to this taxon (Branch 1998) were shown to be more closely related to *A. halli* and might represent a cryptic species (Makhubo et al. 2015). *Other important names*: none.

Distribution: *Afroedura nivaria* is distributed in the Drakensberg of KwaZulu-Natal and Free State provinces, South Africa (De Waal 1978; Bates 1996b; Bourquin 2004). It may also occur in Lesotho, although it has not yet been recorded from there. *EOO*: 13 600 km²; *Distribution*: 5 000 km².



Country of occurrence: South Africa.

Habitat and ecology: This gecko uses rock flakes on rock outcrops and narrow crevices in sandstone cliffs as shelter. It occurs on outcrops and boulders in Montane Grassland at elevations of 1 370–3 000 m a.s.l. (De Waal 1978; Bourquin 2004). *Habitat*: Grassland.

Threats: There are no significant threats.

Population trend: The population size is thought to be stable as the rupicolous habitat of this lizard has not been impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the proposed cryptic species needs to be evaluated.

Afroedura nivaria, hatchling, Kamberg, KwaZulu-Natal province (© C.R. Hundermark).

Afroedura nivaria, Highmoor, KwaZulu-Natal province (© L. Kemp).

Family **Gekkonidae**

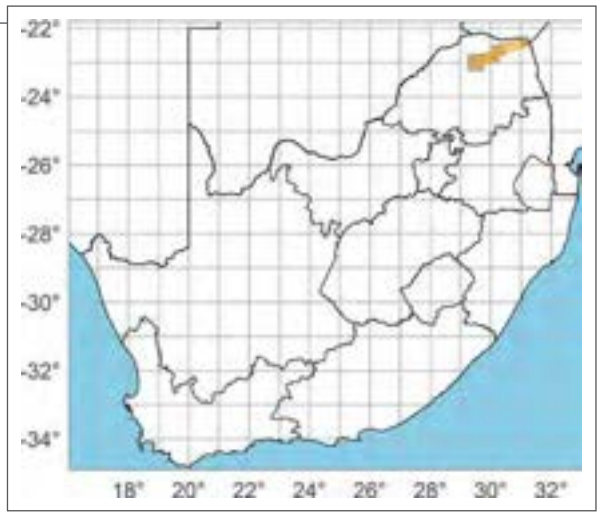
Afroedura pienaari Jacobsen, Kuhn, Jackman & Bauer, 2014

Pienaar's Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: No current taxonomic issues, but see Jacobsen (1989, 1992) for historic taxonomic context. *Other important names*: *Afroedura pondolia* subsp. nov.; *Afroedura langi* 'Waterpoort'; *Afroedura langi* 'Tshipise'; *Afroedura langi* 'Shinokwen'.

Distribution: Occurs from the Soutpansberg eastwards to northern Kruger National Park, Limpopo province, South Africa (Jacobsen et al. 2014). *EOO*: 7 740 km²; *Distribution*: 6 300 km².

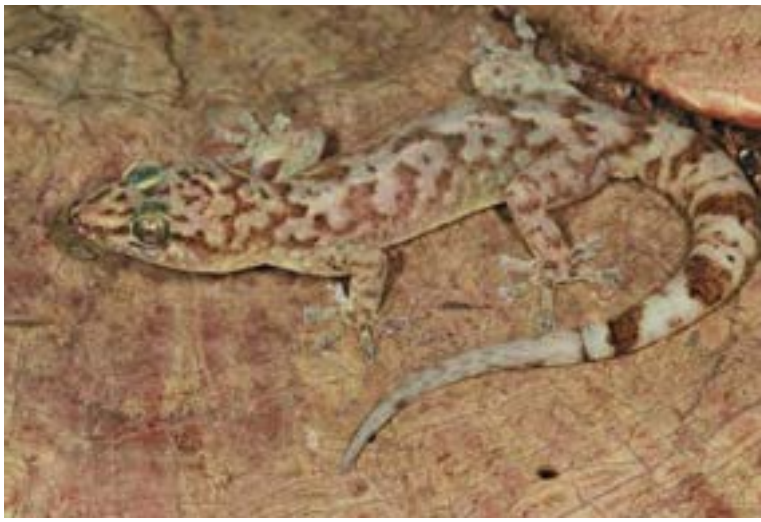
Country of occurrence: South Africa.

Habitat and ecology: This is a rupicolous species that occurs on rock outcrops where it shelters in cracks and under rock flakes. *Habitat*: Savanna.

Threats: There are no significant threats.

Population trend: The population is not considered to be in decline given that much of its range is in areas with little habitat transformation.

Conservation and research recommendations: No recommendations.



Afroedura pienaari, Lajuma, Limpopo province (© L. Kemp).

Afroedura pienaari, Medike Nature Reserve, Soutpansberg, Limpopo province (© G.K. Nicolau).

Family **Gekkonidae**

Afroedura pondolia (Hewitt, 1925)

Pondo Flat Gecko

South African endemic

LC – Least Concern (Global)

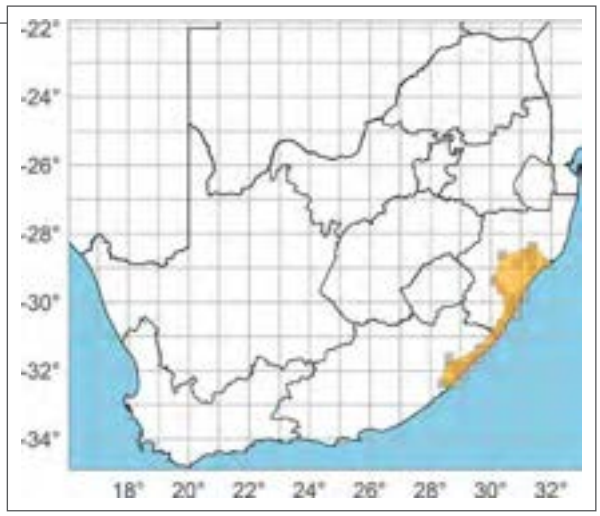
Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a relatively large range and is abundant, although much of its range is heavily modified, and this may have some local impacts.

Taxonomic notes: A phylogenetic analysis indicated that *A. pondolia* comprises two well-supported phylogenetic clades (Makhubo et al. 2015), within which there are four cryptic species (Busschau et al. 2019). There is a possible zone of sympatry between *A. pondolia* and *A. nivaria* in the foothills of the Drakensberg that might be due to misidentified specimens. Furthermore, although *A. pondolia* and *A. marleyi* are clearly distinct species (Jacobsen et al. 2014), they are morphologically similar, and this may result in misidentification of specimens from coastal KwaZulu-Natal province. *Other important names*: none.

Distribution: Occurs from the eastern regions of the Eastern Cape province, South Africa, to central KwaZulu-Natal province. The distribution appears to be naturally patchy throughout much of the range. There is a subpopulation to the north of the main distribution that might represent a separate species (Makhubo et al. 2015). *EOO*: 53 000 km^2; *Distribution*: 30 200 km^2.



Afroedura pondolia, Mboyti, Eastern Cape province (© W. Conradie).

Country of occurrence: South Africa.

Habitat and ecology: *Afroedura pondolia* is a rupicolous species, occurring on rock outcrops and cliffs in a variety of wooded habitats (Branch 1998; Bourquin 2004) at elevations of 0–900 m a.s.l. Also found in trees in and around Durban (Alexander 1990). *Habitat*: Forest, Savanna.

Threats: There may be some local declines due to habitat modification caused by urbanisation as *A. pondolia* appears to be more abundant in undisturbed habitat (Alexander 1990). In some places, *A. pondolia* is syntopic with *Hemidactylus mabouia* (Bourquin 1987; Alexander 1990). Despite some authors suggesting that *H. mabouia* might outcompete *A. pondolia* (e.g., Branch 1998), this has not been demonstrated conclusively.

Population trend: Although much of the habitat within its range has been modified, this gecko seems to also use man-made structures. The overall population size is thus assumed to be stable, despite some local declines.

Conservation and research recommendations: The potential impacts of *Hemidactylus mabouia* on *A. pondolia* should be assessed.

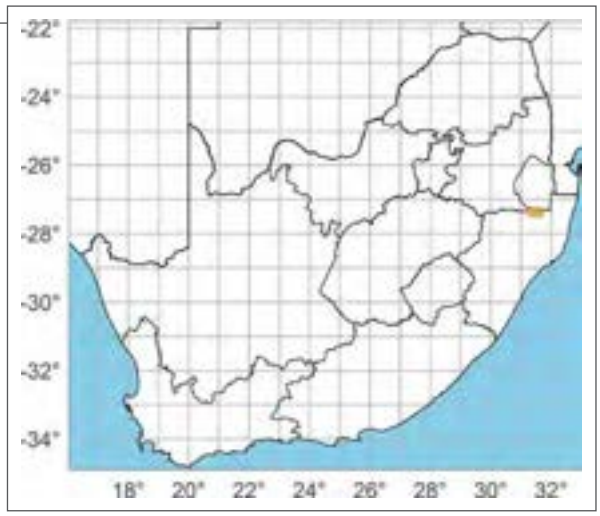
Afroedura pongola Jacobsen, Kuhn, Jackman & Bauer, 2014

Pongola Flat Gecko

South African endemic

DD – Data Deficient (Global)

Assessors: Tolley, K.A., Bates, M.F.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).

Assessment rationale: The distribution of this species is not known and it therefore cannot be assessed for threat status. There is no significant habitat loss at the sites where it has been recorded, but the overall landscape is moderately to heavily transformed. The species could range from Least Concern if the distribution is large and primarily intersects with non-modified areas or could be in a high threat category if the distribution is small and intersects with heavily modified areas.

Taxonomic notes: No current taxonomic issues, but see Jacobsen (1989) and Bourquin (2004) for historic taxonomic context. *Other important names*: *Afroedura pondolia* 'Godlwayo'; *Afroedura* sp. nov. 'Pongola flat gecko'.

Distribution: Only known from two sites north of the Pongola River in northeastern KwaZulu-Natal province, South Africa (Jacobsen et al. 2014). Its overall distribution and EOO cannot be estimated with any confidence and therefore have not been included.

Country of occurrence: South Africa.

Habitat and ecology: This species is rupicolous, utilising narrow crevices between rocks and under exfoliating rock flakes (Jacobsen et al. 2014). *Habitat*: Grassland, Savanna.

Threats: There is too little information on distribution to assess whether the species is impacted by threats. However, there are no known threats at the two sites where the species has been recorded.

Population trend: Inferences regarding population trends cannot be made.

Conservation and research recommendations: Given that *A. pongola* is Data Deficient, surveys aimed at assessing the distribution would be the first step to gather essential information required to complete an assessment of this species.

Afroedura pongola, Godlwayo, KwaZulu-Natal province (© B. Branch).

Afroedura pongola, Godlwayo, KwaZulu-Natal province (© T. Ping).

Family **Gekkonidae**

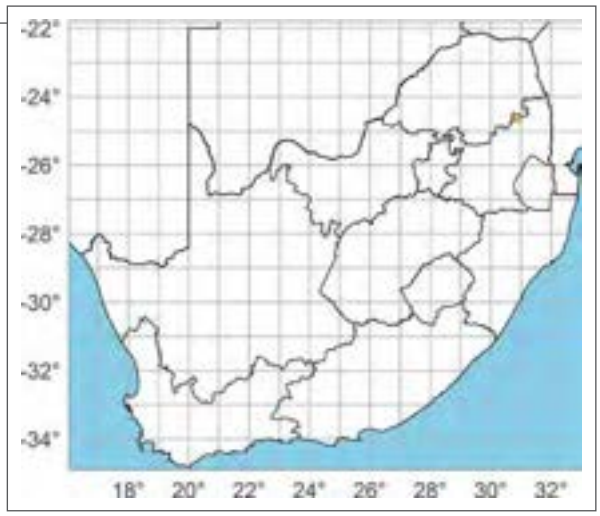
Afroedura rondavelica Jacobsen, Kuhn, Jackman & Bauer, 2014

Blyde River Flat Gecko

South African endemic

DD – Data Deficient (Global)

Assessors: Tolley, K.A., Bates, M.F.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).

Assessment rationale: This species is known from only two specimens collected in 1991 at the same locality, and from recent sight observations (in 2021) from the same locality. There is no significant habitat loss at the exact site where this gecko has been recorded. The overall landscape is intact to the north but is moderately to heavily transformed south of this only known site. The species could range from Least Concern if the distribution is larger and primarily intersects with non-modified areas or could be in a high threat category if the distribution is small and intersects with heavily modified areas.

Taxonomic notes: This species has not been included in any phylogenetic analyses, but its weakly verticillate tail, smooth dorsal scales and single internasal scale, as well as its geographic location, suggest that it falls within the *Afroedura marleyi–A. maripi–A. pongola* group. *Other important names*: none.

Distribution: Recorded from only a single site at Three Rondavels in the Blyde River Canyon Nature Reserve, Mpumalanga province, South Africa (Jacobsen et al. 2014). Its distribution and EOO cannot be estimated with any confidence and therefore have not been included.

Country of occurrence: South Africa.

Habitat and ecology: Observations suggest that this gecko shelters in deep, vertical crevices in sandstone cliffs (Jacobsen et al. 2014; D.W. Pietersen, pers. obs. 2021). *Habitat*: Savanna.

Threats: Threats are unknown, although the type locality is well protected.

Population trend: The species has only been recorded from one locality and is considered Data Deficient. It is therefore not possible to infer any population trends.

Conservation and research recommendations: Given that *Afroedura rondavelica* is Data Deficient, surveys aimed at assessing its distribution would be the first step needed to collect information essential to assess the species.

Afroedura rondavelica, Three Rondavels, Mpumalanga province (© N. Jacobsen).

Family **Gekkonidae**

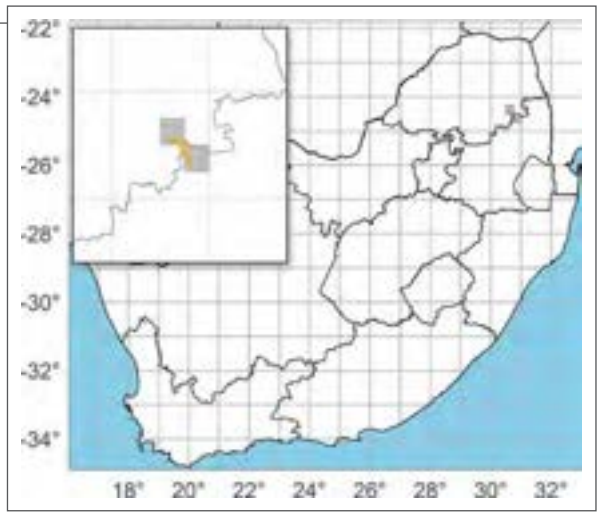
Afroedura rupestris Jacobsen, Kuhn, Jackman & Bauer, 2014

Abel Erasmus Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Pietersen, D.W., Conradie, W., Weeber, J., Alexander, G.J., Tolley, K.A.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).

Assessment rationale: Although this gecko has a small EOO, it occurs in areas that are largely unimpacted by human developments and can be locally abundant. They are tolerant of a degree of habitat transformation, having been found on the walls of buildings. New records show that it is more widespread than initially thought.

Taxonomic notes: This species has not yet been included in a phylogenetic analysis. According to Jacobsen et al. (2014) it shares bluntly keeled to trihedral dorsal scales with *A. haackei*, *A. multiporis* and *A. major* and therefore may be part of the same clade. *Other important names*: *Afroedura multiporis* 'Abel Erasmus'.

Distribution: This species occurs along the upper margin of the eastern escarpment in southern Limpopo and northern Mpumalanga provinces, South Africa, from Abel Erasmus Pass in the north to Bourke's Luck in the south. *EOO*: 400 km²; *Distribution*: 228 km².

Country of occurrence: South Africa.

Habitat and ecology: Frequents rock crevices in sandstone cliffs and quartzite outcrops (Jacobsen et al. 2014), also occurring on the walls of buildings near natural rocky habitats. *Habitat*: Grassland, Savanna.

Threats: Although the greater area is subject to intensive and expanding agriculture and informal human settlements, this species' preference for rock outcrops largely precludes these threats impacting upon it.

Population trend: The population is inferred to be stable as there are no major threats to this species and most of its range occurs in protected areas.

Conservation and research recommendations: Surveys aimed at better assessing the extent of this species' distribution would be beneficial.

Afroedura rupestris, Abel Erasmus Pass, Limpopo province (© G.K. Nicolau).

Afroedura rupestris, Blyde River area, Mpumalanga province (© L. Kemp).

Family **Gekkonidae**

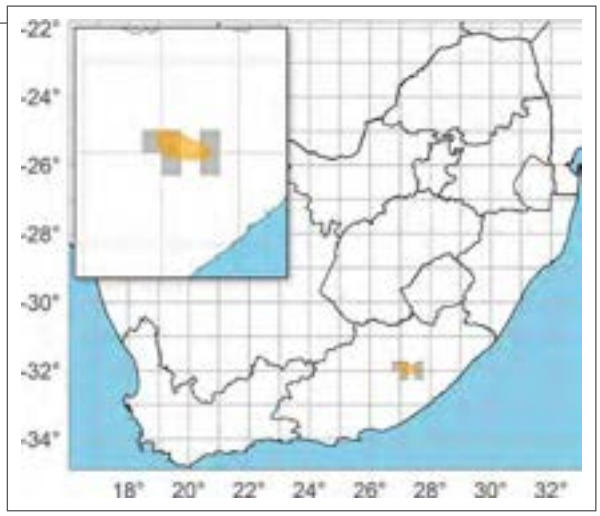
Afroedura tembulica (Hewitt, 1926)

Tembu Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a small range within which there has been some habitat modification, but most of the habitat is intact.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Has a fairly small range in the central region of the Eastern Cape province, South Africa, but it is possibly more widespread. *EOO*: 1 730 km^2; *Distribution*: 1 710 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Rupicolous, occurring in mesic rocky habitats (Branch 1998), at elevations of 1 150–1 800 m a.s.l. *Habitat*: Grassland, Savanna.

Threats: There are no known major threats to this species, although there is some land transformation in the region. The species is not known to occur in any protected area (Tolley et al. 2019a).

Population trend: Although the range is not large, most of the habitat has not been transformed, which mitigates against the negative effects of local population declines in impacted areas.

Conservation and research recommendations: No recommendations.

Afroedura tembulica, Komani, Eastern Cape province (© G.K. Nicolau).

Afroedura transvaalica (Hewitt, 1925)

Zimbabwe Flat Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

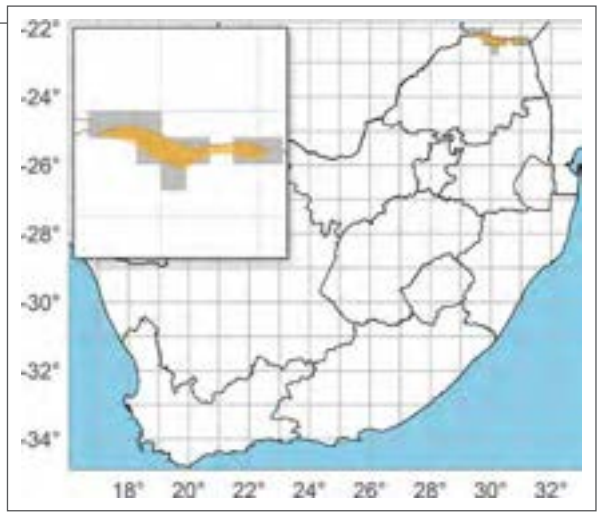
Assessment rationale: Although only a small part of this species' range is in South Africa, there is little habitat transformation where it occurs.

Taxonomic notes: The distribution was thought to consist of three disjunct populations (e.g., Onderstall 1984), but sampling across Zimbabwe suggests that populations are not divergent (D.G. Broadley, pers. comm. 2012). Despite this, a phylogenetic study showed some genetic structure within this species with individuals from South Africa and southern Zimbabwe being somewhat divergent from individuals from northern Zimbabwe (Jacobsen et al. 2014). *Other important names*: none.

Distribution: Occurs mainly in Zimbabwe (Onderstall 1984; Branch 1998), marginally entering South Africa in the Limpopo River Valley (Jacobsen et al. 2014). There is at least one record from central Mozambique immediately adjacent to the Zimbabwean border (Broadley 1966a) and it may occur in extreme eastern Botswana as well (Auerbach 1987). This species was believed to be more widespread in northern Limpopo province (e.g., Jacobsen 1989; Branch 1998), but most of these records are now referred to the newly described *Afroedura pienaari*. *EOO*: 4 390 km²; *Distribution*: 2 780 km².

Countries of occurrence: Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Rupicolous, occurring on granite and sandstone boulders and outcrops in mesic Savanna (Jacobsen 1989; Branch 1998) at elevations of 500–1 300 m a.s.l. *Habitat*: Savanna.



Threats: There are no substantial threats to this species.

Population trend: Despite the small geographic range of this species in South Africa, it occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Afroedura transvaalica, Mapungubwe, Limpopo province (© J. Marais).

Family **Gekkonidae**

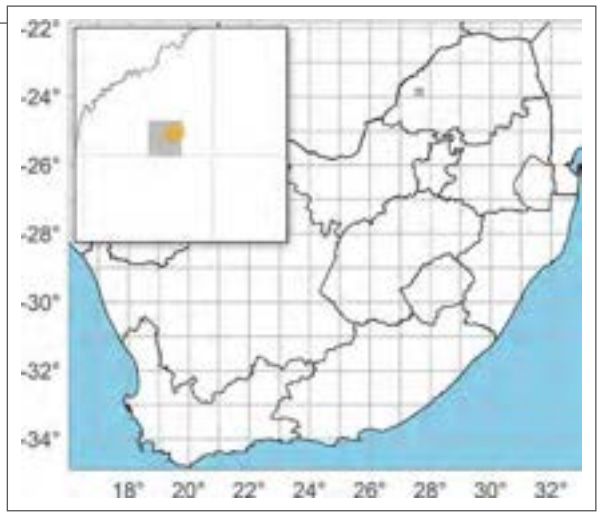
Afroedura waterbergensis Jacobsen, Kuhn, Jackman & Bauer, 2014

Waterberg Flat Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: Although its inferred range is small, this species may occur more widely within the Waterberg (Jacobsen et al. 2014). It is locally abundant, the distribution is not notably impacted by habitat loss and there are no significant threats.

Taxonomic notes: No current taxonomic issues, but see Jacobsen (1989, 1992) for historic taxonomic context. *Other important names*: *Afroedura langi* 'Waterberg'.

Distribution: Occurs on the Waterberg massif, Limpopo province, South Africa (Jacobsen et al. 2014), and nearby areas. *EOO*: 188 km^2; *Distribution*: 180 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species uses crevices on rocky sandstone outcrops and cliffs (Jacobsen et al. 2014). *Habitat*: Savanna.

Threats: There are no significant threats.

Population trend: The population size is thought to be stable as the rupicolous habit of this species means that it has not been negatively impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Afroedura waterbergensis, Swebeswebe, Limpopo province (© C.R. Hundermark).

Family **Gekkonidae**

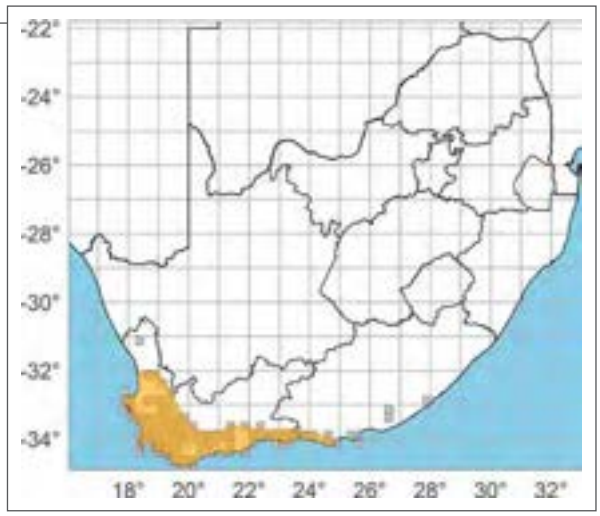
Afrogecko porphyreus (Daudin, 1802)

Marbled Leaf-toed Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J., Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread, abundant and tolerant of transformed habitats.

Taxonomic notes: Although two isolated subspecies have been described, *A. p. cronwrighti* (Hewitt, 1937a) from Cape St Francis in the Eastern Cape province and *A. p. namaquensis* (Hewitt, 1935) from the western margin of South Africa (Bitterfontein, Little Namaqualand), neither is recognised currently (e.g., Branch 1998). Substantial genetic divergence across the Cape Fold Mountains has been noted (Heinicke et al. 2014), suggesting that a taxonomic revision is required. *Other important names*: *Phyllodactylus porphyreus*.

Distribution: Occurs across the southern Cape region of South Africa, in both mountainous and lowland regions. It is commensal with humans, which allows it to persist in peri-urban areas. It appears to have been introduced to Namibia and some continental islands off South Africa (Branch 1991). Incorrectly cited from FitzSimons (1943) as occurring on St Helena island in the mid-Atlantic Ocean (Bauer & Branch 1997; Bauer et al. 1997; Branch 1998). FitzSimons (1943) does not mention this locality and the species is not noted in the most recent review of reptiles for the island (Ashmole & Ashmole 2000). Although the record

Afrogecko porphyreus, Gordon's Bay, Western Cape province (© L. Kemp).

Family **Gekkonidae**

Afrogecko porphyreus, Noordhoek, Western Cape province (© M. Lundberg).

from Bitterfontein (Western Cape province) was previously considered questionable or representing a translocated individual (Branch 2014b) and there are no recent records from there, this is the type locality for *A. p. namaquensis* (Hewitt 1935). There are several inland records that have been discounted (Bates & Branch 2018a) and probably were misidentifications. It is unknown whether populations in Gqeberha, Makhanda and East London were introduced or if they are relict populations. Because this species is prone to human-assisted dispersal, extralimital single occurrence records (Branch 2014b) have been excluded from the distribution. *EOO*: 290 000 km^2; *Distribution*: 59 600 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species occurs across most of the Fynbos biome and forested mountain gorges, extending into the Succulent Karoo biome. It shelters under tree bark, wood debris, exfoliating rock flakes and fissures in rock outcrops. Is active at night, using rock faces and climbs into bushes and trees. It is also commensal with humans and can be common in peri-urban areas (Branch 1998) sheltering in crevices of buildings and walls, and under household and garden fixtures. In some cases, several individuals may shelter together. *Habitat*: Forest, Shrubland.

Threats: There are no significant threats to this species. However, the Cape Town population could be threatened by high levels of predation from domestic cats (*Felis catus*; Seymour et al. 2020). The Cape Town population also co-occurs (syntopically) with the introduced and established gecko, *Lygodactylus capensis*, but the effect of this has not been assessed.

Population trend: Although there has been a reduction in habitat quality and extent in some parts of its range, the species is widespread, locally abundant and tolerates habitat transformation to an extent. The population is thus unlikely to have declined significantly, with the possible exception of the Cape Town population due to predation by domestic cats.

Conservation and research recommendations: The status of the two subspecies and the taxonomic status of subpopulations within the Cape Fold Mountains should be assessed. Measures to reduce predation by domestic cats in Cape Town would be beneficial for this gecko, such as confining cats or fitting them with various deterrent devices (Seymour et al. 2020).

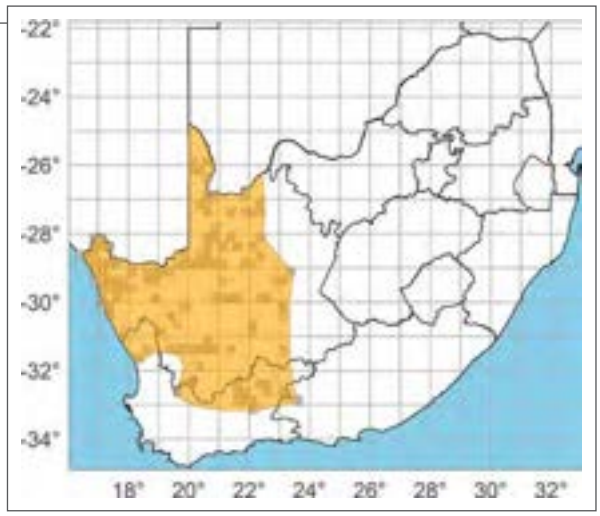
Family **Gekkonidae**

Chondrodactylus angulifer Peters, 1870

Giant Ground Gecko

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J., Bates, M.F.



Previous Red List categories:
2010: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Chondrodactylus angulifer angulifer* – Least Concern (SARCA).
2014: *Chondrodactylus angulifer namibensis* – Least Concern (SARCA).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: The subspecies *C. a. namibensis* (Haacke 1976a) occurs in extreme northwestern South Africa and in Namibia, whereas *C. a. angulifer* is more widespread, occurring across most of western South Africa, Namibia and Botswana. However, the subspecies do not appear to be genetically distinct (Heinz et al. 2021) and the two forms are sympatric in parts of the range (Haacke 1976b; Bauer & Branch 2001). The subspecies may simply represent clinal variation in colouration (Heinz et al. 2021), but this requires further investigation. *Other important names*: none.

Distribution: Occurs in the western part of South Africa, western, central and southern Namibia and southwestern parts of Botswana. In South Africa, it is widespread throughout the sandy regions of the western and northwestern Kalahari, Little Namaqualand and Karoo. There are two questionable

Chondrodactylus angulifer, male colouration, Aggeneys, Northern Cape province (© L. Kemp).

Family **Gekkonidae**

Chondrodactylus angulifer, female colouration, Beaufort West, Western Cape province (© L. Verburgt).

records from the southwestern Cape region (ReptileMap: 73481; FitzSimons 1937; Heinz et al. 2021) that have not been included in the current distribution map. *EOO*: 439 000 km^2; *Distribution*: 317 000 km^2.

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: A large, terrestrial gecko that burrows in loosely compacted sand in the sparsely vegetated, sandy valleys of arid regions (Haacke 1976a). *Habitat*: Desert, Shrubland.

Threats: Some localised habitat transformation has occurred, but this is not considered to be a significant threat to this species.

Population trend: The population size is suspected to be stable because the extent of habitat transformation is small in relation to the large range of this species. Any local population declines are not thought to be significant.

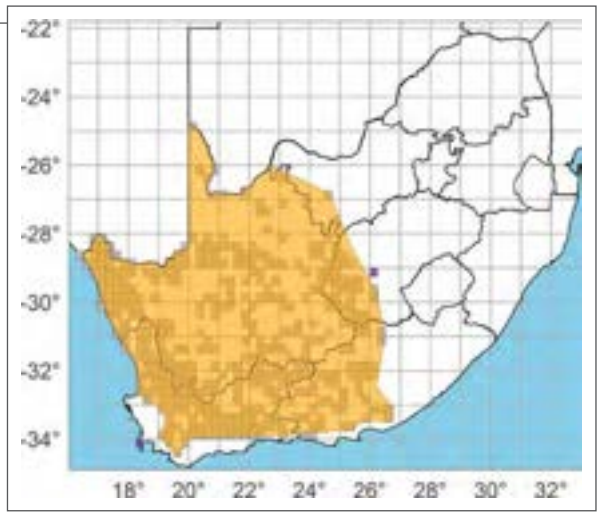
Conservation and research recommendations: A more comprehensive assessment that includes wide geographic sampling of the two subspecies is needed.

Chondrodactylus bibronii (Smith, 1846)

Bibron's Gecko

LC – Least Concern (Regional)

Assessors: Conradie, W., Bauer, A.M., Pietersen, D.W., Alexander, G.J., Tolley, K.A., Bates, M.F., Weeber, J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no substantial threats, and commensal with humans to some extent.

Taxonomic notes: No notable issues. *Other important names*: *Pachydactylus bibronii*.

Distribution: Occurs in southern Namibia, southwestern Botswana and central and western South Africa (Heinz et al. 2021). There is an extralimital population in the Kommetjie region in Cape Town, which was introduced several decades ago (apparently by John Wood of the South African Snake Farm). The earliest confirmed record from this population was in 1985, with additional recent records on iNaturalist (2018 and 2020). There is also an introduced population in Bloemfontein (Douglas 1997). *EOO*: 726 000 km^2; *Distribution*: 594 000 km^2.

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: A large nocturnal and rupicolous gecko that is widespread and occurs in several habitats. It sometimes forms aggregations on rock outcrops and is often commensal with humans in rural settings such as farm buildings but is not common in urbanised areas (Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is suspected to be stable because this is a widespread and abundant gecko that occurs mainly in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Chondrodactylus bibronii, Prince Albert, Western Cape province (© C.R. Hundermark).

Chondrodactylus bibronii, Bitterfontein, Northern Cape province (© C. Keates).

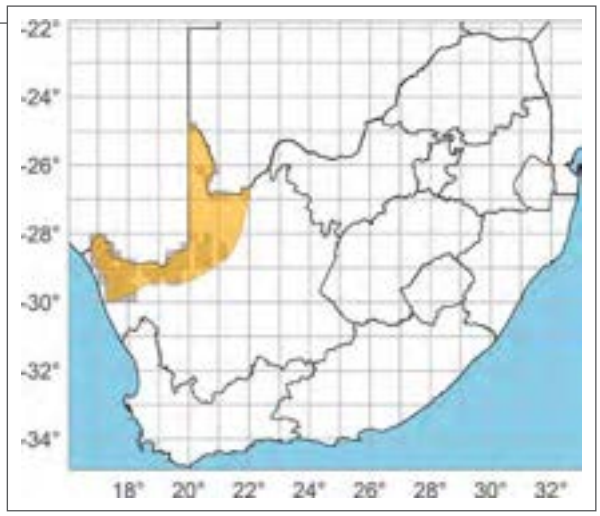
Family **Gekkonidae**

Chondrodactylus laevigatus (Fischer, 1888)

Button-scaled Gecko

LC – Least Concern (Regional)

Assessors: Conradie, W., Pietersen, D.W., Alexander, G.J., Tolley, K.A., Weeber, J.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no substantial threats, and commensal with humans to some degree.

Taxonomic notes: The taxonomy of the *Chondrodactylus turneri–C. bibronii* group, of which *C. laevigatus* is a member, has been problematic to resolve. A phylogenetic study showed that *C. turneri* consists of two species, with *C. turneri sensu stricto* occurring only in the east. The other population has been assigned to *C. laevigatus* (northwest South Africa, western Botswana, Namibia, southern Angola, northern Zimbabwe, Zambia, Malawi, northern Mozambique, Tanzania, southern Kenya) (Marques et al. 2018; Heinz et al. 2021). *Other important names*: *Pachydactylus bibronii turneri*; *Pachydactylus laevigatus laevigatus*; *Pachydactylus turneri*.

Distribution: Widespread across southern Africa from northwestern South Africa to East Africa, mainly through the arid corridor (Heinz et al. 2021). In South Africa, it occurs in the arid regions of the northwestern Northern Cape province. *EOO*: 146 000 km^2; *Distribution*: 61 000 km^2.

Countries of occurrence: Angola, Botswana, Malawi, Mozambique, Namibia, Kenya, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Rupicolous and arboreal, occurring across a wide range of arid and mesic Savanna habitats. *Habitat*: Savanna.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs mainly in areas that are not impacted by habitat transformation.

Threats: There are no substantial threats to this species.

Conservation and research recommendations: None recommended.

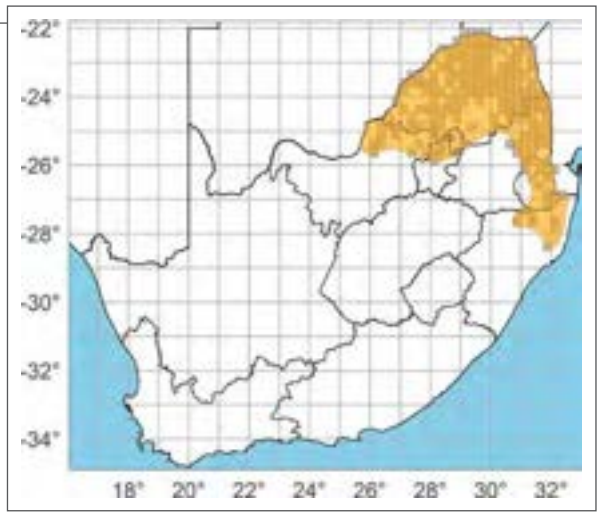
Chondrodactylus laevigatus, Okahandja, Namibia (© L. Verburgt).

Chondrodactylus turneri (Gray, 1864)

Turner's Gecko

LC – Least Concern (Regional)

Assessors: Conradie, W., Pietersen, D.W., Alexander, G.J., Tolley, K.A., Weeber, J., Bates, M.F.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no substantial threats and commensal with humans to some degree.

Taxonomic notes: The taxonomy of the *Chondrodactylus turneri–C. bibronii* group has been problematic to resolve. A phylogenetic study showed that *C. turneri* consists of two species, with *C. turneri sensu stricto* occurring only in the east. The other population has been assigned to *C. laevigatus* (northwest South Africa, western Botswana, Namibia, southern Angola, northern Zimbabwe, Zambia, Malawi, northern Mozambique, Tanzania, southern Kenya) (Marques et al. 2018; Heinz et al. 2021). *Other important names*: *Pachydactylus bibronii turneri*; *Pachydactylus turneri*.

Distribution: Occurs in southern Botswana, Zimbabwe and western Mozambique into northern South Africa and western Eswatini (Heinz et al. 2021). In South Africa, it occurs in the mesic northeastern region. *EOO*: 300 000 km²; *Distribution*: 200 000 km².

Countries of occurrence: Botswana, Eswatini, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: A large nocturnal, rupicolous and terrestrial gecko that inhabits rock outcrops, old houses (Branch 1998) and hollow trees. *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.

Chondrodactylus turneri, Hoedspruit, Limpopo province (© L. Kemp).

Chondrodactylus turneri, Polokwane, Limpopo province (© R.I. Stander).

Family **Gekkonidae**

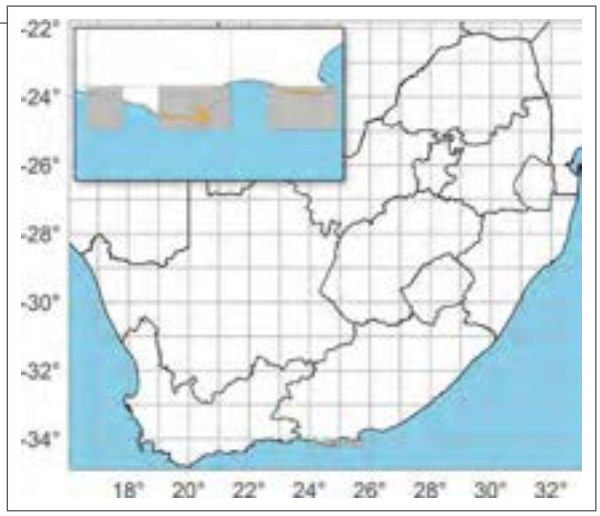
Cryptactites peringueyi (Boulenger, 1910)

Salt Marsh Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Weeber, J., Alexander, G.J., Pietersen, D.W., Tolley, K.A.



Previous Red List categories:

2018: Near Threatened (Global IUCN assessment).
2017: Critically Endangered (Global IUCN assessment).
2014: Critically Endangered (SARCA).
1996: Data Deficient (Global IUCN assessment) as *Phyllodactylus peringueyi*.
1994: Data Deficient (Global IUCN assessment) as *Phyllodactylus peringueyi*.

Reason for recent change: Non-genuine.

Assessment rationale: This species was previously thought to have a small range, limited to two isolated subpopulations occurring within 100 m of tidal reaches and an EOO of 40 km² (Branch 2017; Bates et al. 2018). However, recent surveys show that it is much more widespread and the new EOO is estimated to be over 1 500 km². With this much wider range, it is no longer considered severely fragmented or susceptible to stochastic events. It has been recorded from some coastal, peri-urban areas and is suspected to be present in several small, protected areas. Furthermore, urban development and other land use change is prohibited along the coastal regions, which constitutes a large part of its range. Therefore, no further significant habitat loss is expected.

Taxonomic notes: This taxon was separated from *Phyllodactylus* and placed in the monotypic genus

Cryptactites peringueyi, Kini Bay, Eastern Cape province (© W. Conradie).

Cryptactites peringueyi, Cape Recife, Eastern Cape province (© L. Kemp).

Cryptactites by Bauer et al. (1997). *Other important names*: *Phyllodactylus peringueyi*.

Distribution: Occurs along the coastal areas of the Eastern Cape province, South Africa, as two subpopulations – at Gqeberha and at St Francis Bay (Nicolau et al. 2021). Most records are within 100 m of the high-water mark. Recent and historical records show that the species extends 5–10 km inland along the Krom River estuary and ± 155 km along the coast. It now appears to be absent from the type locality (Chelsea Point) but is common elsewhere. *EOO*: 1 510 km^2; *Distribution*: 138 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species occurs under vegetation mats in salt marshes, *Phragmites* reed clumps and the coastal shrub *Syncarpha sordescens*, as well as on man-made structures and under vegetation in peri-urban habitats. *Habitat*: Artificial urban areas, marshes, Shrubland.

Threats: Historically, this species was thought to be under threat from coastal development. However, non-zoned coastal development is no longer allowed within 1 km of the high-water mark, and previously zoned development areas are not allowed within 100 m of the high-water mark (DEA 2008). These restrictions will prevent further habitat transformation in the future. The species has been recorded on man-made structures and under vegetation in peri-urban areas (Branch 1996; Nicolau et al. 2021).

Population trend: In spite of the small geographic range of this species, it occurs in an area where habitat transformation is now highly regulated. There may have been a historical population decline due to initial habitat transformation, but it is suspected that the population size is now stable.

Conservation and research recommendations: Additional surveys to provide more information on the distribution and an assessment of this species' tolerance to transformed habitats would be useful. Because the limiting factors that restrict this species to its small distribution are currently unknown, an assessment of ecological preferences would be useful. Given that this species might be a habitat specialist, the population should be monitored at key localities with the aim of early detection for enigmatic population declines.

Family **Gekkonidae**

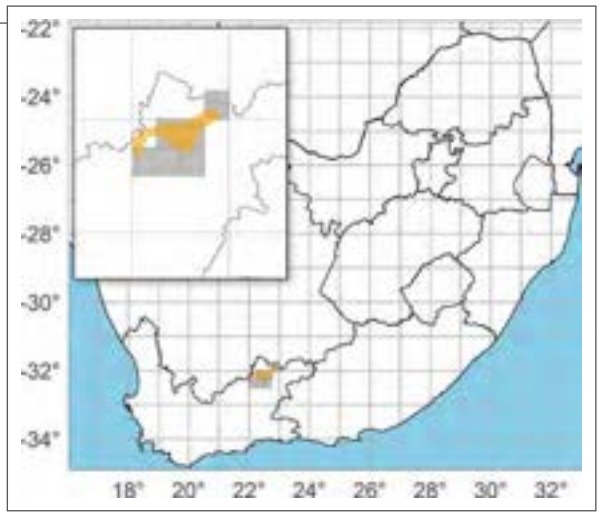
Goggia braacki (Good, Bauer & Branch, 1996)

Braack's Pygmy Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a small range but occurs in areas that have little habitat alteration. Previously considered Near Threatened due to a very restricted range, new occurrence records show that the range is not restricted and covers an area where habitat loss and degradation is minimal.

Taxonomic notes: No taxonomic issues. *Other important names*: *Phyllodactylus braacki*.

Distribution: Occurs along the south-central portion of the Great Escarpment in the Western Cape province, South Africa, at high elevations (Good et al. 1996; Branch 1998). *EOO*: 2 140 km²; *Distribution*: 1 450 km².

Country of occurrence: South Africa.

Habitat and ecology: Uses rock cracks and exfoliating flakes on dolerite boulders and outcrops for shelter. Although previously noted to occur in Montane Grassland (Branch & Braack 1989, Branch 1998), this vegetation type makes up only a small proportion of the range. The majority of the distribution occurs within Karoo Shrubland vegetation, although the higher elevations consist of a mixture of grasses and shrubs. Most records have been from high elevation (1 500–1 900 m a.s.l.). *Habitat*: Shrubland.

Threats: There are no significant threats.

Population trend: Not considered to be in decline. Most of the range is in an area that has little anthropogenic impact, so the habitat is essentially intact.

Conservation and research recommendations: There are few records of this species. Surveys in adjacent areas along the Great Escarpment might be useful to better assess how widely the species occurs.

Goggia braacki, Karoo National Park, Western Cape province (© W. Conradie).

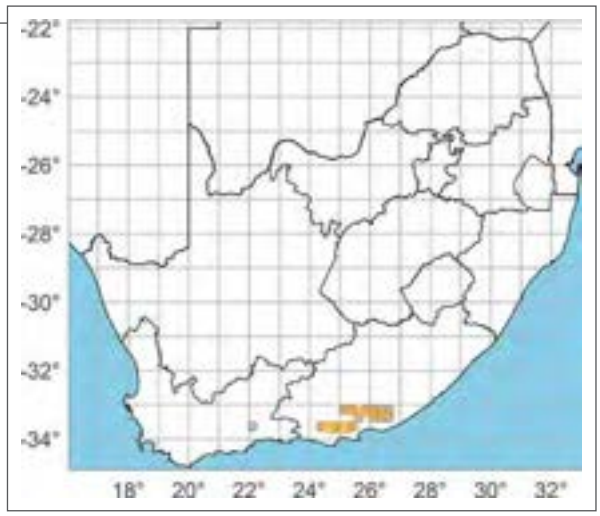
Goggia essexi (Hewitt, 1925)

Essex's Pygmy Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: This species is relatively common, well protected and has a moderate-sized distribution. It appears to be tolerant of relatively high grazing pressures within its habitat.

Taxonomic notes: No taxonomic issues, although this species is morphologically similar to *G. hewitti*, leading to confusion between the two species. *Other important names*: *Phyllodactylus essexi*.

Distribution: Distributed in the south-central Eastern Cape province, South Africa. It is probably more widespread, but the range is difficult to define due to confusion with *G. hewitti*. Recent records show that this species extends marginally into the Western Cape province (Heinicke et al. 2017). *EOO*: 24 600 km^2; *Distribution*: 8 050 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Uses small rock outcrops and exfoliating flakes on shale and sandstone with low vegetation cover in karroid Thicket and grassy Fynbos (Branch et al. 1995; Branch 1998). *Habitat*: Shrubland.

Threats: There are no major threats to this species.

Population trend: Although there has been a reduction in habitat quality in some parts of its range, the species is locally abundant and tolerates transformation of habitats to an extent. The population is thus unlikely to have declined significantly.

Conservation and research recommendations: No recommendations.

Goggia essexi, Alicedale, Eastern Cape province (© L. Kemp).

Family **Gekkonidae**

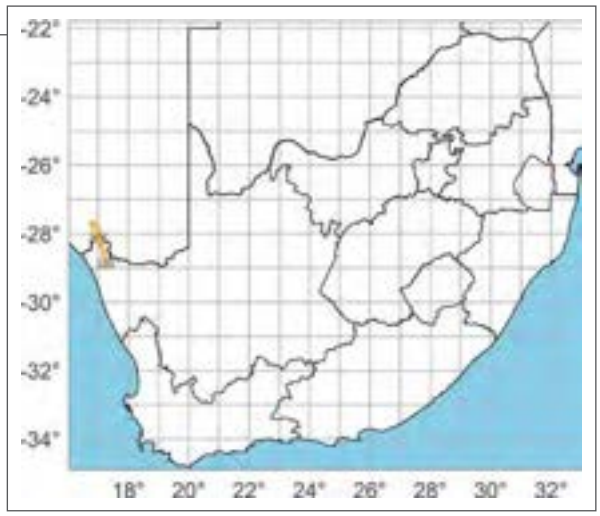
Goggia gemmula (Bauer, Branch & Good, 1996)

Richtersveld Pygmy Gecko

South African near-endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
2010: Data Deficient (Global IUCN assessment).

Reason for recent change: non-genuine.

Assessment rationale: Has a small distribution but occurs mainly within a protected area. There is little habitat alteration within the range. Although previously considered Near Threatened due to a decline in habitat quality and extent because of tourism and livestock, an examination of the most recent national land cover spatial data shows that there is very little habitat loss across most of the range.

Taxonomic notes: No taxonomic issues. *Other important names*: *Phyllodactylus gemmulus*.

Distribution: Occurs in the Richtersveld region of the Northern Cape province, South Africa, and the adjacent parts of southern Namibia. *EOO*: 3 100 km^2; *Distribution*: 2 600 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs under exfoliating flakes on small dolerite outcrops (Bauer et al. 1996; Bauer & Branch 2001). *Habitat*: Desert, Shrubland.

Threats: There are no significant threats to the habitat at present. However, this gecko occurs in an area that has been impacted by long-term drought and this, along with the predicted negative effects of climate change in this region (Engelbrecht et al. 2015), may be an emerging threat.

Population trend: Because much of the geographic range of this species is in protected areas, the population size is assumed to be stable.

Conservation and research recommendations: Improved survey data for the area could be useful to refine the interpreted distribution and estimated EOO. Research on this species is needed to assess its response to predicted climate change.

Goggia gemmula, near Rosh Pinah, Namibia (© A. Cilliers).

Family **Gekkonidae**

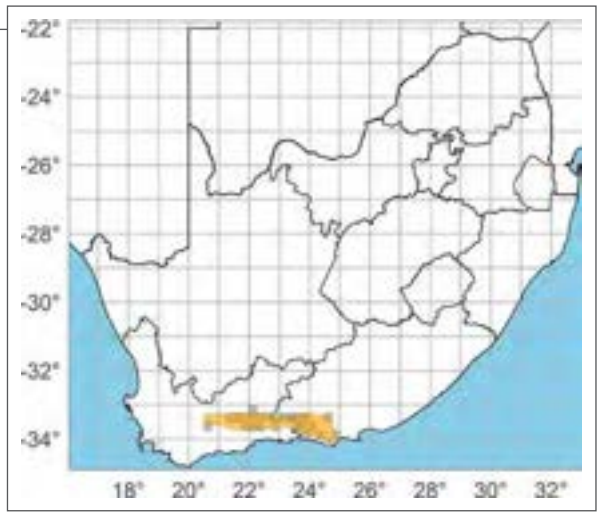
Goggia hewitti (Branch, Bauer & Good, 1995)

Hewitt's Pygmy Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: *Goggia hewitti* is widespread and common across its range and appears to be tolerant of some anthropogenic disturbance.

Taxonomic notes: No taxonomic issues, although this species is morphologically similar to *G. essexi*, leading to confusion between the two species. *Other important names*: *Phyllodactylus hewitti*.

Distribution: This species occurs across the central and eastern Cape Fold Mountains, South Africa. *EOO*: 25 000 km^2; *Distribution*: 18 800 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Inhabits small rock outcrops and exfoliating flakes on shale and sandstone outcrops with low vegetation cover (Branch 1990a; Branch & Bauer 1995). *Habitat*: Shrubland.

Threats: There are no major threats to this species.

Population trend: This species is not considered to be in decline, as it occurs in mountainous areas that are not significantly impacted by habitat alteration.

Conservation and research recommendations: No recommendations.

Goggia hewitti, near Calitzdorp, Western Cape province (© T. Ping).

Goggia hewitti, Baviaanskloof, Eastern Cape province (© C. Keates).

Family **Gekkonidae**

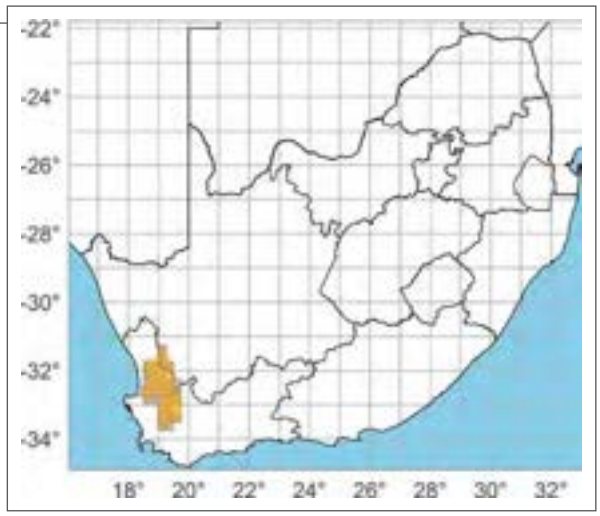
Goggia hexapora (Branch, Bauer & Good, 1995)

Cederberg Pygmy Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: A common species with a fairly large distribution and no major threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: *Goggia hexapora* is distributed in the northwestern Cape Fold Mountains in the Western Cape province and adjacent areas of the Northern Cape province, South Africa. *EOO*: 22 200 km^2; *Distribution*: 18 100 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Inhabits small rock outcrops and exfoliating flakes on shale and sandstone within Fynbos and Renosterveld vegetation (Branch et al. 1995). *Habitat*: Shrubland.

Population trend: Because much of the geographic range of this species is in areas that are not impacted by habitat transformation, the population size is assumed to be stable.

Threats: There are no major threats to this species.

Conservation and research recommendations: No recommendations.

Goggia hexapora, Traveller's Rest in Cederberg, Western Cape province (© M. Lundberg).

Goggia incognita Heinicke, Turk & Bauer, 2017

Cryptic Pygmy Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Weeber, J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: This species has a relatively large distribution and is not impacted by any significant threats.

Taxonomic notes: There is potentially a contact zone between *G. lineata* and *G. incognita* in the north of the distribution around the Knersvlakte that could cause taxonomic confusion and misidentifications. *Other important names*: *Phyllodactylus lineatus*; *Goggia lineata*.

Distribution: Occurs in the western parts of the Western Cape province, South Africa, from the Knersvlakte in the north to Worcester in the south and east along the Langeberg to Ladismith, with additional records further east in the Little Karoo and Great Karoo (Heinicke et al. 2017). Although there are records of *G. lineata* (which are now referred to *G. incognita*) from around Cape Town and the Cape Peninsula (Branch 2014c), these are probably in error. *EOO*: 78 000 km²; *Distribution*: 52 900 km².

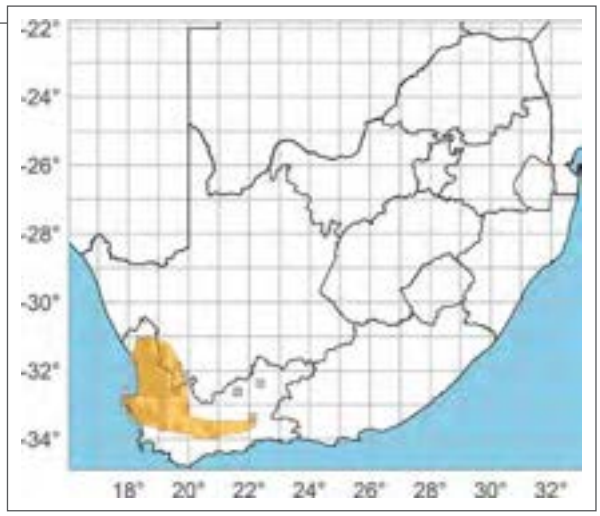
Country of occurrence: South Africa.

Habitat and ecology: Shelters under stones or boulders, plant litter, aloe stems and other debris (Heinicke et al. 2017). *Habitat*: Shrubland.

Threats: There are no major threats to this species.

Population trend: Not in decline given that most of its range is not impacted by habitat transformation.

Conservation and research recommendations: Additional records from the potential contact zone between *G. incognita* and *G. lineata* are needed for the refinement of the interpreted distributions for these species and an assessment of the apparent overlap zone.



Goggia incognita, West Coast National Park, Western Cape province (© T. Ping).

Goggia incognita, Yzerfontein, Western Cape province (© L. Kemp).

Family **Gekkonidae**

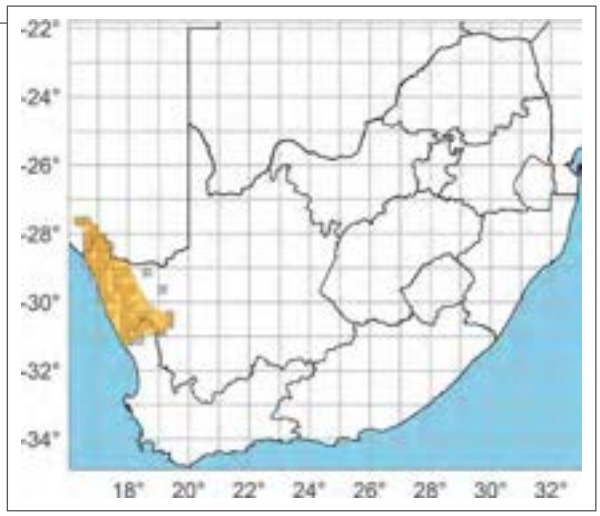
Goggia lineata (Gray, 1838)

Striped Pygmy Gecko

South African near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Weeber, J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species that is relatively tolerant of low-level agricultural and urban development.

Taxonomic notes: The southern populations of *G. lineata* were assigned to a new species, *G. incognita* (Heinicke et al. 2017), and the two species appear to be parapatric in the Knersvlakte area. *Other important names*: *Phyllodactylus lineatus*.

Distribution: Occurs along the arid western margin of South Africa from the coastal area to about 170 km inland. It is peripheral in southern Namibia (Sperrgebiet and Karasburg districts; Branch 1994). In South Africa, it occurs as far south as the Knersvlakte in the Northern Cape province, where it apparently overlaps with the northern extent of *G. incognita*. *EOO*: 56 000 km²; *Distribution*: 46 000 km².

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Inhabits small rock outcrops and rock piles with low vegetation cover and also dead *Aloe* and *Crassula* stems (Branch et al. 1995). *Habitat*: Shrubland.

Threats: There are no major threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: Surveys in the potential contact zone between *G. lineata* and *G. incognita* are needed. New specimens from this zone should be incorporated into an additional phylogenetic analysis to assist with identifications of these geckos in the contact zone.

Goggia lineata, Noup, Northern Cape province (© G. Alexander).

Goggia lineata, Noup, Northern Cape province (© G. Alexander).

Family **Gekkonidae**

Goggia matzikamaensis Heinicke, Turk & Bauer, 2017

Matzikama Pygmy Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Weeber, J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: Although this species has a small known distribution, there are currently no significant threats.

Taxonomic notes: This recently described species was previously referable to *Goggia rupicola* (Branch et al. 1995; Bauer et al. 1997; Heinicke et al. 2017). *Other important names*: *Phyllodactylus rupicolus*; *Goggia rupicola*.

Distribution: Recorded only in the vicinity of Kliprand at the southern edge of Little Namaqualand, Northern Cape province, South Africa (Heinicke et al. 2017). *EOO*: 835 km^2; *Distribution*: 834 km^2.

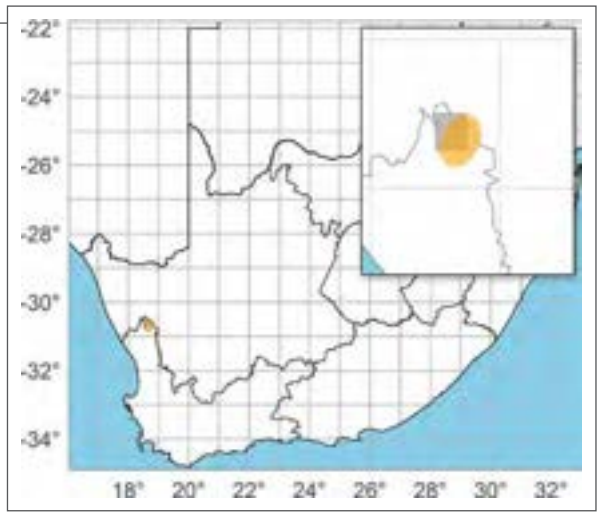
Country of occurrence: South Africa.

Habitat and ecology: Shelters in rock cracks within the Succulent Karoo biome (Heinicke et al. 2017). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The species is not considered to be in decline given the lack of threats in the region where it occurs.

Conservation and research recommendations: Additional surveys could aid in refining the extent of the distribution.



Goggia matzikamaensis, Kliprand, Northern Cape province (© C. & S. Dorse).

Goggia matzikamaensis, Kliprand, Northern Cape province (© M. Burger).

Family **Gekkonidae**

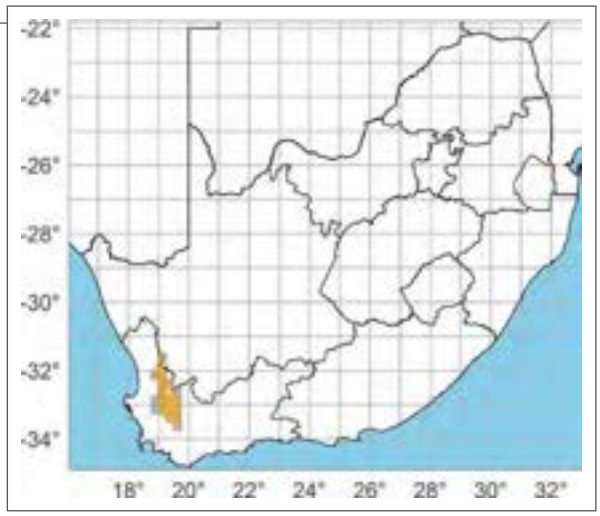
Goggia microlepidota (FitzSimons, 1939)

Small-scaled Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Lower Risk/Near Threatened (Global IUCN assessment) as *Phyllodactylus microlepidotus*.
1994: Rare (Global IUCN assessment) as *Phyllodactylus microlepidotus*.

Assessment rationale: This gecko occurs in mountainous regions that are not significantly impacted by habitat transformation.

Taxonomic notes: No taxonomic issues. *Other important names*: *Phyllodactylus microlepidotus*.

Distribution: This species occurs in the northwestern extent of the Cape Fold Mountains of South Africa, mainly in the Cederberg range. *EOO*: 11 120 km^2; *Distribution*: 8 890 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Inhabits large rock cracks on extensive rock outcrops in Fynbos and transitional vegetation (Branch & Bauer 1996). *Habitat*: Shrubland.

Threats: There are no major threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Goggia microlepidota, Porterville, Western Cape province (© C. & S. Dorse).

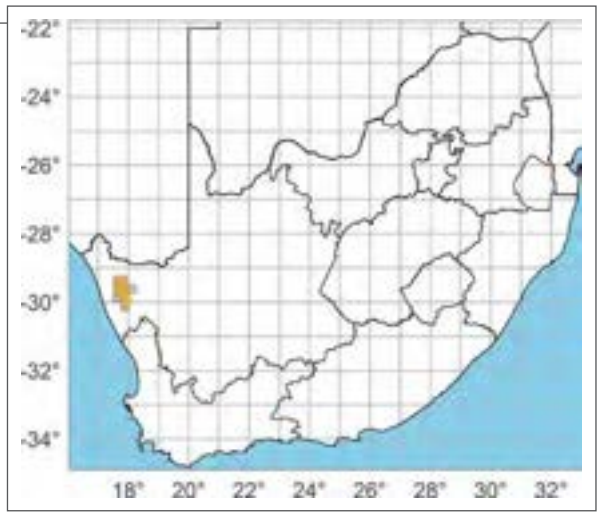
Goggia rupicola (FitzSimons, 1938)

Namaqua Pygmy Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a small distribution but occurs in several protected areas and in areas where there is little habitat transformation.

Taxonomic notes: The southern subpopulation of *Goggia rupicola* has been assigned to a new species, *G. matzikamaensis* (Heinicke et al. 2017). *Other important names*: *Phyllodactylus rupicolus*.

Distribution: *Goggia rupicola* occurs in northwestern South Africa, along the northern and western margins of the Kamiesberg and Komaggas Hills in the Northern Cape province (Heinicke et al. 2017). *EOO*: 4 050 km^2; *Distribution*: 3 770 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Uses small rock outcrops and exfoliating flakes on rock boulders and bedrock in Succulent Karoo vegetation. *Habitat*: Shrubland.

Threats: There are no major threats to this species.

Population trend: Despite the small distribution, the population size is assumed to be stable because the species is abundant and there is little habitat alteration within the distribution.

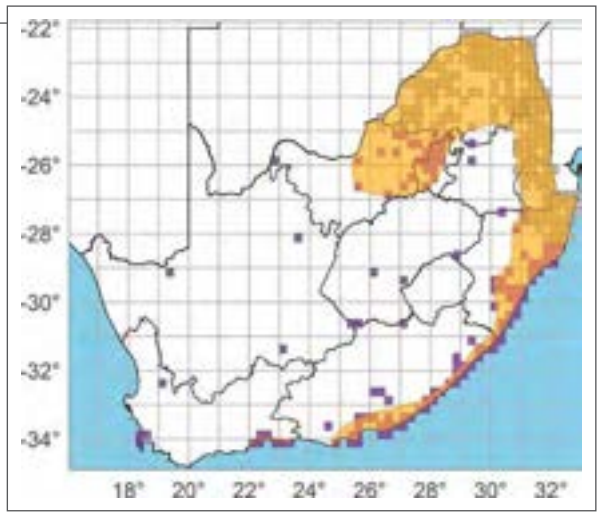
Conservation and research recommendations: No recommendations.

Goggia rupicola, Steinkopf, Northern Cape province (© L. Kemp).

Family **Gekkonidae**

Hemidactylus mabouia (Moreau de Jonnès, 1818)

Common Tropical House Gecko



LC – Least Concern (Regional)

Assessors: Tolley, K.A., Weeber, J., Conradie, W., Pietersen, D.W., Bates, M.F., Alexander, G.J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant with no substantial threats. This species is commensal with humans across most of its range.

Taxonomic notes: *Hemidactylus mabouia* is a species complex, with the taxonomic status of the various constituent lineages still requiring clarification (Vences et al. 2004; Agarwal et al. 2021). The validity of *H. mercatorius* as a species distinct from *H. mabouia*, with which it had previously been confused, was confirmed by Vences et al. (2004). Uncertainty over the exact definitions of these two species remains, making it difficult to delineate the global distribution of either species (but see Agarwal et al. 2021). Given the uncertainty over the taxonomic assignment of African populations, this assessment follows Rocha et al. (2010) and Agarwal et al. (2021) in restricting the name *H. mercatorius* to island populations, with continental populations assigned to *H. mabouia*. Phylogenetic and morphological analyses indicate that there are several undescribed species currently within *H. mabouia*, and that there are at least two undescribed species in northeastern South Africa (Agarwal et al. 2021). In contrast, the establishment of the population that occurs along the eastern margin of South Africa appears to have been the result of several different human-mediated jump-dispersal events that probably occurred in both historical and modern times (Agarwal et al. 2021). *Other important names*: none.

Hemidactylus mabouia, Mkambati Nature Reserve, Eastern Cape province (© W. Conradie).

Distribution: This species occurs across most of sub-Saharan Africa and has also been extensively translocated globally (see Kraus 2009; Agarwal et al. 2021). Regionally, it occurs from the northeast (Limpopo province), extending southwards along the eastern margin as far south as Gqeberha in the Eastern Cape province, South Africa. There are also scattered records all along the southern coastal area as far west as Cape Town. However, *H. mabouia sensu stricto* appears to have been historically limited to Central and West Africa (Agarwal et al. 2021). Other parts of the African distribution originated either through human-mediated jump-dispersal events or are represented by undescribed cryptic taxa (Agarwal et al. 2021). Within the region, the presumed natural range was previously restricted to mesic areas of the northern provinces and the northern Indian Ocean coastal strip of South Africa (FitzSimons 1943) until the 1960s, after which it expanded southwards along the coast (Bourquin 1987, 2004). Since that time, the range in South Africa has increased, most likely due to multiple jump-dispersal events into urban areas and range expansion partially owing to anthropogenic habitat alteration. Early records from Pretoria, Gauteng province (Roux 1907) and Mortimer in the Western Cape province (Cott 1934) were dismissed (FitzSimons 1943), but it is possible that these in fact represent very early translocations. This supports a recent phylogenetic study that suggests the distribution along the eastern margin of the region is not part of the natural range but was the result of multiple jump-dispersal events all along the eastern coastal region (Agarwal et al. 2021), presumably followed by local range expansions from the introduction points.

The expanded range is now mostly continuous along the eastern coastal region. Although it appears that at least some of these populations were established through human-assisted jump-dispersal (Agarwal et al. 2021), the fact that the distribution is now continuous as far south as Gqeberha has resulted in all records up to this point being included in the EOO estimation. Outlying records and isolated subpopulations away from the main distribution have not been included in the estimation of the EOO. The range map polygon shows the current distribution, with the grid cells colour-coded to the best estimate of the original range (orange) and the expanded range (purple). *EOO*: 1 237 000 km^2; *Distribution*: 296 000 km^2.

Countries of occurrence: Angola, Benin, Botswana, Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Eswatini, Ethiopia, Gabon, Ghana, Guinea, Kenya, Liberia, Malawi, Mali, Mozambique, Namibia, Nigeria, Rwanda, São Tomé and Principe, Senegal, Somalia, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe. Outside Africa: see Agarwal et al. 2021; Von May et al. 2021.

Habitat and ecology: The presumed historically natural part of the range is tropical and in the region this species occurs mainly in coastal areas but extends inland in the northern areas. It occurs in trees and on rock outcrops in natural areas (Branch 1998), and on buildings where it is commensal with humans. Despite having originated in tropical areas, this gecko species is a highly successful invader across subtropical areas. This might be attributed to there being suitable thermal habitat in areas where there are humans (i.e., warm microclimates where there is urbanisation), or that *H. mabouia* has either a labile, or a large temperature preference breadth (see Agarwal et al. 2021). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population is likely increasing due to the commensal nature of this species, which contributes to the increasing extent of the distribution.

Conservation and research recommendations: The eastern portion of the distribution appears to be the result of jump-dispersal and *H. mabouia* is therefore not indigenous to the region. However, this finding was based on very limited sampling (see Agarwal et al. 2021) and should be confirmed through more comprehensive geographic coverage in the east. The potential for further range expansion could be gauged through an assessment of the thermal biology of this species.

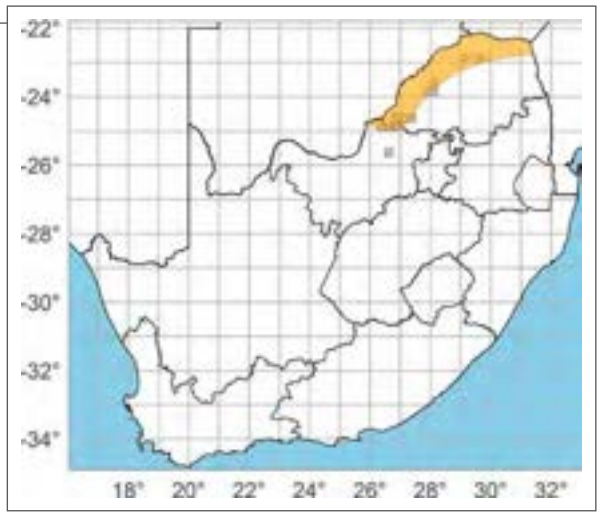
Family **Gekkonidae**

Homopholis arnoldi Loveridge, 1944

Arnold's Velvet Gecko

LC – Least Concern (Regional)

Assessor: Bates, M.F.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Assessment rationale: This species has a large range with no major threats or habitat loss.

Taxonomic notes: Broadley et al. (2014) resurrected this species from synonymy with *H. wahlbergii*. There are no further taxonomic issues. *Other important names*: *Homopholis wahlbergii arnoldi*; *Homopholis wahlbergii*.

Distribution: Eastern Botswana, Zimbabwe, southern and central Mozambique north of the Limpopo River, and South Africa in the northern and western parts of Limpopo province, extending into the northern parts of adjacent North West province (Broadley et al. 2014). There are a few unconfirmed records of this species from Klaserie, Limpopo province, that require validation. *EOO*: 98 000 km^2; *Distribution*: 45 700 km^2.

Countries of occurrence: Botswana, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Shelters in rock crevices, under bark or in holes in trees, hollow logs and even in swallow nests. Commensal with humans and occurs on the walls of buildings and in thatch roofs (Broadley et al. 2014). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: This widespread, common species tolerates some habitat transformation and is commensal with humans in parts of the range. Therefore, the population size is assumed to be stable.

Conservation and research recommendations: No recommendations.

Homopholis arnoldi, Blouberg, Limpopo province (© M. Petford).

Homopholis arnoldi, Shingwedzi, Kruger National Park, Limpopo province (© G.K. Nicolau).

Family **Gekkonidae**

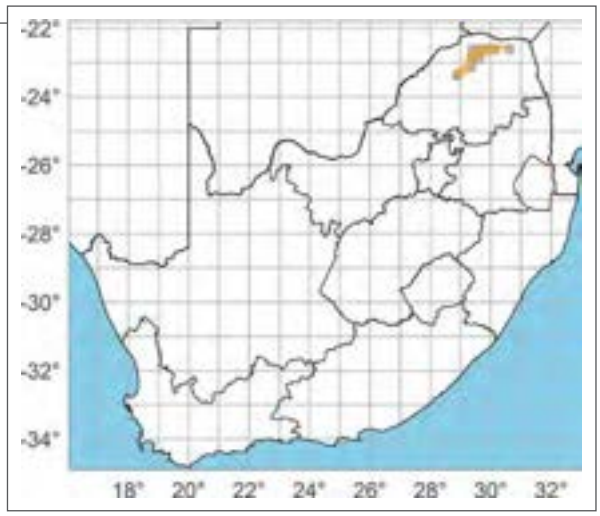
Homopholis mulleri Visser, 1987

Muller's Velvet Gecko

South African endemic

NT – Near Threatened A3c (Global)

Assessors: Tolley, K.A., Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).
1996: Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Genuine.

Assessment rationale: This species has a small range and although the western portion of its range has some habitat transformation, most of the range has not been significantly transformed. Although previously assessed as Vulnerable in 2017 due to habitat loss and degradation from agriculture and urbanisation, this was based on an inaccurate estimate of the EOO. Furthermore, examination of the most recent national land cover layer shows that habitat loss affects only 16% of the range. While there is some concern regarding the removal of trees for firewood and charcoal production, this probably does not affect the majority of the range. Nevertheless, the emerging threat of strip coal mining over a large portion of the species' range would result in a rapid decline in the extent and quality of habitat. This is expected to translate into a significant population

Homopholis mulleri, Waterpoort, Limpopo province (© R.I. Stander).

Family Gekkonidae

decline. This gecko has therefore been uplisted to Near Threatened.

Taxonomic notes: There are no taxonomic issues. *Other important names*: none.

Distribution: Occurs across northern Limpopo province, South Africa. It was thought to be restricted to mopane (*Colophospermum mopane*) veld in the Soutpansberg region, but recent records show that it is more widespread and also occurs in other Savanna habitat types (e.g., Petford & Van Huyssteen 2017). *EOO*: 7 780 km^2; *Distribution*: 4 750 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Usually shelters in holes in marula (*Sclerocarya birrea*) and knob-thorn (*Senegalia nigrescens*) trees in mopane veld during the day (Visser 1987; Jacobsen 1989). *Habitat*: Savanna.

Threats: In the western portion of the range there is habitat clearance for agricultural use, and extraction of mature trees for firewood, wood carving and charcoal production. This habitat loss appears to be ongoing, with about 3% of the habitat being lost since 1990. The area where this species occurs is potentially under threat from proposed coal mining, and the mining footprint could be large enough to impact a large portion of the distribution. It is therefore suspected to be at fewer than five threat-defined locations, although it is unknown when the threat of mining is likely to become active (see: www.mcmining.co.za).

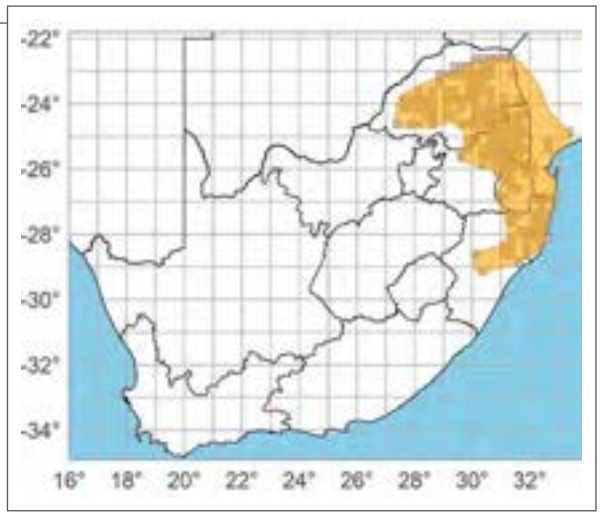
Population trend: The species is not suspected to be in decline at present given that most of the distribution has experienced little land transformation. However, the removal of trees from areas that are not transformed could be reducing the amount of microhabitat for this species and this might cause declines. If the threat of mining becomes active, it is expected that the population would experience a decline. Although generation time is not known, it is likely to be five years or less. Therefore, a population decline of more than 30% would require longer than three generations.

Conservation and research recommendations: Improved distribution data, as well as information on habitat preferences, would allow an assessment as to whether the species might be impacted by harvesting of trees in parts of the range. The potential impact from the proposed large-scale coal mining should be monitored.

Family **Gekkonidae**

Homopholis wahlbergii (Smith, 1849)

Wahlberg's Velvet Gecko



Regional near-endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread and common and tolerates peri-urban environments. There are no major threats.

Taxonomic notes: A taxonomic review and molecular phylogeny found that *H. wahlbergii arnoldi* is a valid species (Broadley et al. 2014). There are no other outstanding taxonomic issues. *Other important names*: none.

Distribution: Occurs in northeastern South Africa, Eswatini and Mozambique south of the Limpopo River. Extends into the KwaZulu-Natal province midlands along the Thukela River Valley in central KwaZulu-Natal province (Bourquin 2004, 2019). *EOO*: 294 300 km^2; *Distribution*: 203 300 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa.

Habitat and ecology: Mainly nocturnal but also active on overcast days. Shelters in rock crevices, in tree hollows and under loose bark. Tolerates peri-urban habitats, where it is often found on the walls of buildings (Branch 1998; Broadley et al. 2014) or in thatch roofs. *Habitat*: Forest, Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: Although there has been some habitat loss, the large geographic range and abundance of this lizard mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Homopholis wahlbergii, Hoedspruit, Limpopo province (© D.W. Pietersen).

Homopholis wahlbergii, Waterberg, Limpopo province (© C. Keates).

Family **Gekkonidae**

Lygodactylus bradfieldi Hewitt, 1932

Bradfield's Dwarf Gecko

LC – Least Concern (Regional)

Assessor: Bates, M.F.

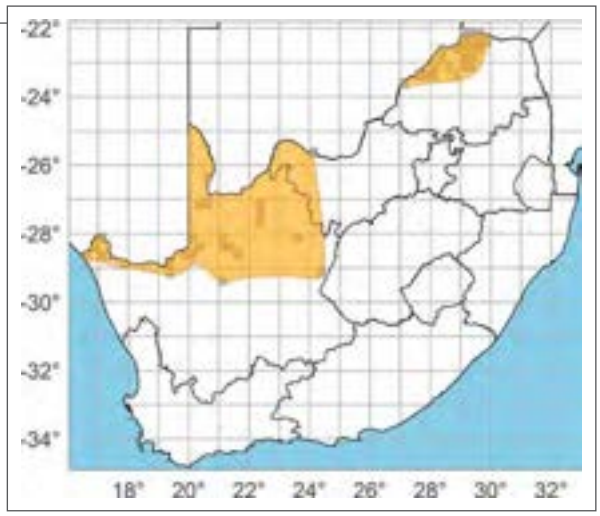
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Relatively widespread and common, with no major threats.

Taxonomic notes: Although *L. bradfieldi* was previously considered a subspecies of *L. capensis* (FitzSimons, 1943) and has also been treated as a synonym of *L. capensis* (Loveridge 1947), they are separate species (Röll et al. 2010) despite their morphological similarity. *Other important names*: none.

Distribution: Occurs in South Africa, Namibia, Botswana and adjacent southwestern Zimbabwe (Branch 1998; Jacobsen 2011). In South Africa, the population in northwestern Limpopo province is connected through Botswana extending into the Northern Cape province, with records as far south as Kimberley. The southernmost record in Limpopo province is considered questionable as it may represent a translocation or an atypical *L. capensis* (Jacobsen 2011). Records from KwaZulu-Natal province (Röll et al. 2010) are erroneous. *EOO*: 546 000 km²; *Distribution*: 197 000 km².

Countries of occurrence: Botswana, Namibia, South Africa, Zimbabwe.



Habitat and ecology: Arboreal, living on tree trunks and sheltering under dead bark or in holes (Branch 1998). Favours stands of *Senegalia* and *Vachellia* (previously *Acacia*) trees. *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: There is apparent overlap in distribution of this species with *L. capensis* in the Northern Cape province, but this could be the result of misidentifications given their morphological similarity. This requires further investigation that is informed through the collection of specimens and through the use of DNA barcoding.

Lygodactylus bradfieldi, southern Namibia (© L. Kemp).

Lygodactylus bradfieldi, Lephalale, Limpopo province (© L. Verburgt).

Lygodactylus capensis (Smith, 1849)

Common Dwarf Gecko

LC – Least Concern (Regional)

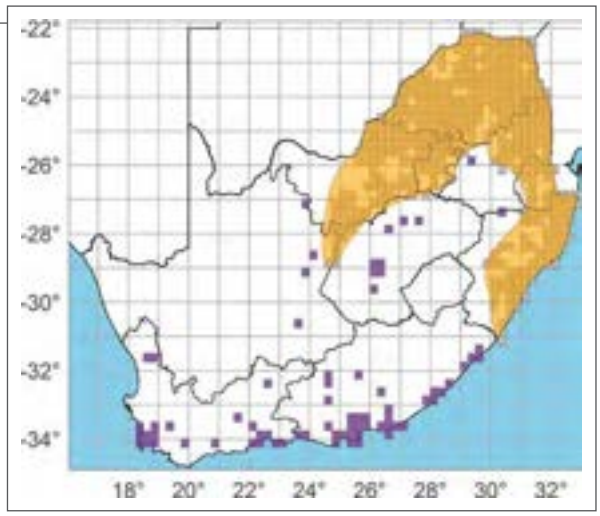
Assessors: Conradie, W., Pietersen, D.W., Weeber, J., Alexander, G.J., Tolley, K.A., Bates, M.F.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Lygodactylus capensis capensis*.

Assessment rationale: Widespread and abundant with no major threats. It is also commensal with humans and easily translocated to the extent that this has resulted in a significant increase in its range.

Taxonomic notes: This widespread species requires a thorough taxonomic investigation, as there appear to be several additional species in the complex (Marques et al. 2020). Several subspecies were previously recognised, but it is currently considered a monotypic species (Rebelo et al. 2019). *Other important names*: none.

Distribution: The natural range of this species is from East Africa, south to northeastern South Africa and west to northern Namibia (Branch 1998; Bates 2005a; De Villiers 2006; Witberg & Van Zyl 2008; Jacobsen 2012; Marques et al. 2020). There are records as far south as Kimberley in the Northern Cape province that are considered part of the natural range. This gecko has expanded its range with numerous introduced sub-populations scattered across South Africa (purple grid squares on map). These likely have been established through human-mediated jump-dispersal given they are mainly in urban areas (Rebelo et al. 2019), and these are not considered in the estimation of EOO. The recorded type locality for this gecko is imprecise (Smith 1849) but may refer to the northeastern part of the Eastern Cape province (Rebelo et al. 2019). This area has currently been mapped as extralimital because



Lygodactylus capensis, Pemba, Mozambique (© G. Alexander).

Lygodactylus capensis, Coega, Eastern Cape province (© L. Kemp).

Family **Gekkonidae**

Lygodactylus capensis, Johannesburg, Gauteng province (© C.R. Hundermark).

there is a distribution gap (70 km) between that area and other records. *EOO*: 633 000 km^2; *Distribution*: 364 000 km^2.

Countries of occurrence: Botswana, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Arboreal in Savanna habitats, but adapts readily to urban situations, utilising buildings and other structures. It is expanding its range in South Africa, but these introduced populations seldom extend into natural vegetation (Rebelo et al. 2019). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The range of this species has expanded due to jump-dispersal and it is commensal with humans, adapting to urban environments. It is therefore likely that the population size is increasing.

Conservation and research recommendations: There is apparent overlap in distribution of this species with *L. bradfieldi* in the Northern Cape province, but this could be the result of misidentifications given their morphological similarity. This requires further investigation that is informed through the collection of specimens and through the use of DNA barcoding.

Family **Gekkonidae**

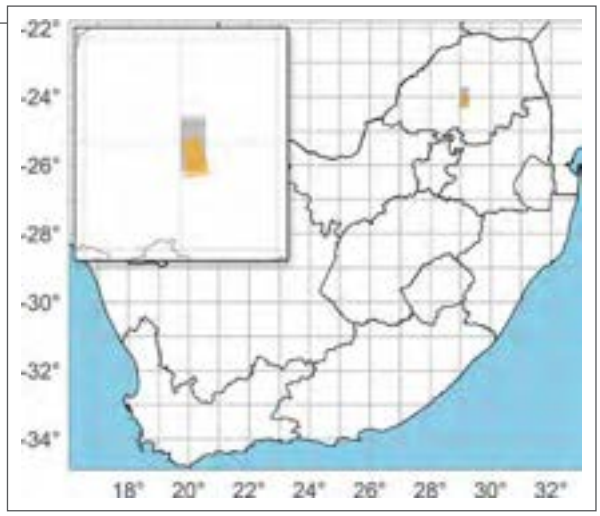
Lygodactylus graniticolus Jacobsen, 1992

Granite Dwarf Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Pietersen, D.W., Weeber, J., Conradie, W., Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a small distribution, and although the overall landscape within its range is heavily impacted, the habitat in which the species occurs has experienced minimal transformation. National land cover data (Geo Terra Image 2015, 2016) shows that EOO most probably has not decreased from its original extent and the species occurs in several protected areas. Previously considered Near Threatened due to a restricted range, this species is now known from a wider range and occurs in at least three protected areas.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs in the granitic hills (Jacobsen 1992a; Travers et al. 2014) that extend from Polokwane south toward Mokopane in central Limpopo province, South Africa. It has been recorded from several protected areas (Percy Fyfe and Witvinger nature reserves, and Makapan Valley World Heritage Site) and the granitic hills that connect these reserves are included as part of the interpreted distribution. *EOO*: 903 km^2; *Distribution*: 820 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Inhabits crevices on boulders in rock outcrops in Bushveld Savanna (Jacobsen 1992a). *Habitat*: Savanna.

Population trend: Habitat loss within the range of the species has been relatively minor, despite fairly heavy transformation in the surrounding area. It is possible that there have been some local declines, but most of the population is probably safeguarded in protected areas and therefore local declines are not thought to contribute significantly to extinction risk.

Threats: The areas around the granitic hills are impacted by agriculture and urbanisation. However, much of the distribution falls either within protected areas, or in the more mountainous surrounding areas that are not heavily impacted.

Conservation and research recommendations: Because there are few records of this species, focused surveys of known populations and of suitable habitat in areas where the species has not yet been recorded would be valuable.

Lygodactylus graniticolus, Makapansgat, Limpopo province (© L. Verburgt).

Family **Gekkonidae**

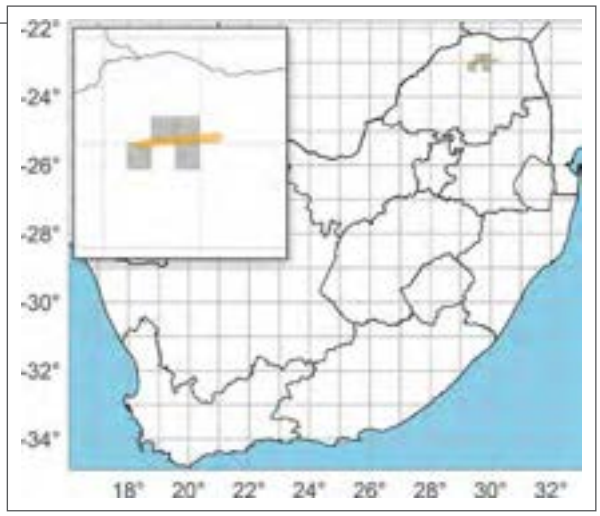
Lygodactylus incognitus Jacobsen, 1992

Cryptic Dwarf Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Alexander, G.J., Tolley, K.A., Conradie, W., Pietersen, D.W., Weeber, J., Bates, M.F.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Data Deficient (Global IUCN assessment).
2014: Least Concern (SARCA) as *Lygodactylus nigropunctatus incognitus*.

Assessment rationale: This species has a small range where it occurs in the Soutpansberg. Although there is little direct habitat transformation within its range at present, niche modelling suggests that the range may contract by more than 75% by the year 2070. Because this species has a short generation length, suspected population declines over the three generations would not be large enough to qualify as threatened under criterion A. Previously considered Data Deficient, this has now been rectified by detailed research (Travers et al. 2014; Petford et al. 2019; Petford & Alexander 2020, 2021a,b).

Taxonomic notes: Previously considered a subspecies of *L. nigropunctatus*, it has subsequently been raised to a full species (Travers et al. 2014). *Other important names*: *Lygodactylus nigropunctatus incognitus*.

Lygodactylus incognitus, Lajuma, Limpopo province (© L. Kemp).

Distribution: This species occurs in the western Soutpansberg, Limpopo province, South Africa (Jacobsen 1992a). *EOO*: 871 km^2; *Distribution*: 780 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in moist, forested and woody patches at cooler, high elevations of the Soutpansberg (Jacobsen 1992a; Kirchhof et al. 2010; Petford et al. 2019; Petford & Alexander 2020, 2021a,b). These geckos inhabit rocky outcrops, tree trunks and branches, and have been observed on the walls of houses (Kirchhof et al. 2010; Petford et al. 2019). *Habitat*: Savanna, Grassland.

Threats: This species is limited to the higher, cooler elevations of the mountains and could be sensitive to climate change and upslope displacement (Petford et al. 2019; Petford & Alexander 2020). Based on a conservative climate change scenario, Petford and Alexander (2021a) predict a range reduction of more than 75% of the current range by the year 2070. There are also several infrastructure and mining developments proposed for the area, which could become active threats in the future.

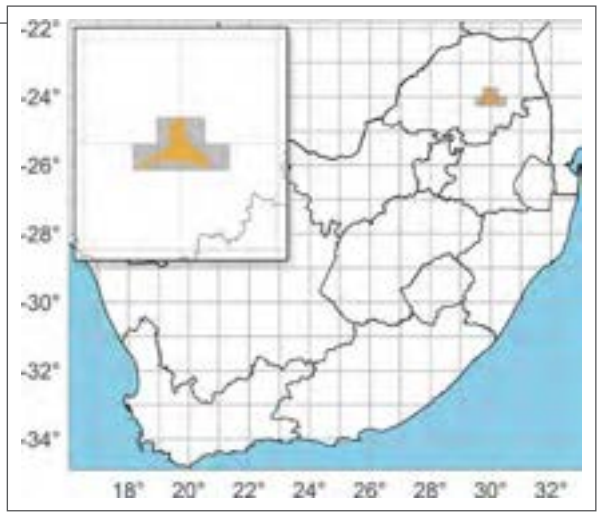
Population trend: Possibly in decline due to upslope displacement from current and predicted climate change. This is already likely to be causing a decline in range size and an increase in population fragmentation. However, there is uncertainty as to what the effect of the suspected range size contraction is in terms of a population decline.

Conservation and research recommendations: The species was poorly protected (Tolley et al. 2019a), but a newly declared national protected area in the Soutpansberg (Western Soutpansberg Nature Reserve; Limpopo Provincial Notice 159 of 2021, 3 December 2021, No. 3220) puts several thousand hectares of the range under protection. Proposed development, mining and predicted climate change are expected to affect this species in the future. It would therefore be useful to conduct additional surveys to assess population trends.

Family **Gekkonidae**

Lygodactylus methueni FitzSimons, 1937

Methuen's Dwarf Gecko



South African endemic

EN – Endangered B1ab(i,iii,iv,v) (Global)

Assessors: Tolley, K.A., Weeber, J., Pietersen, D.W., Conradie, W., Alexander, G.J.

Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).
1996: Vulnerable (Global IUCN assessment).
1994: Vulnerable (Global IUCN assessment).

Assessment rationale: The overall area where this species occurs is highly transformed by silviculture and this has significantly reduced the amount of natural habitat available for this species causing a decline in EOO and AOO. At least 50% of the population is in small habitat patches that are unlikely to have connectivity and gene flow, and therefore may not be viable into the future. Thus, it is considered severely fragmented and inferred to be in decline due to this substantial habitat transformation. It has not been recorded from significantly or moderately transformed habitats, although it has been recorded from man-made structures within the natural vegetation patches. Recent surveys have provided additional occurrence data that has allowed for a better estimate of distribution. However, there is some uncertainty regarding whether the extent and quality of habitat and EOO are still declining at rates significant enough to warrant the listing of this species as Endangered. If

Lygodactylus methueni, Iron Crown, Limpopo province (© L. Kemp).

the habitat loss does not continue, a category of Near Threatened might be more appropriate. For the present assessment, a precautionary approach has been applied and the species is considered Endangered.

Taxonomic notes: Although there are no notable taxonomic issues, the range of *L. methueni* may overlap with that of *L. nigropunctatus*, and these two species can be difficult to distinguish from each other. *Other important names*: none.

Distribution: This species has a fairly small distribution and is endemic to the mountainous areas in the Woodbush/Haenertsburg region of southern Limpopo province, South Africa. *EOO*: 2 100 km^2; *Distribution*: 1 280 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Primarily rupicolous, sheltering in rock cracks on outcrops in Montane Grassland, but also uses trees and bushes adjacent to rock outcrops as basking sites. Has not been recorded from Forests or plantations (Jacobsen 1989) but does bask on man-made structures within natural areas. Records have been collected between 1 600 and 2 100 m a.s.l. *Habitat*: Grassland.

Threats: Historically, there was a significant decline in the extent and quality of Grassland due to habitat conversion for plantations across approximately 50% of the distribution. Comparison of the remaining extent of untransformed vegetation above 1 500 m a.s.l. between 1990 and 2013 (Geo Terra Image 2015, 2016) shows additional declines in the quality and extent of habitat, but this is unlikely to pose a significant added risk of extinction. In the portion of the range that has been transformed, it seems unlikely that individuals can disperse between the remaining habitat fragments, and this most likely affects at least 50% of the population.

Population trend: The establishment of plantations has resulted in the transformation of substantial portions of habitat where the species occurred historically. It is likely that the population is in decline and severely fragmented in the part of the range that is highly transformed. The suitable habitat patches are separated by plantations that are much larger in size (e.g., hundreds of hectares) than the remaining habitat patches (e.g., tens of hectares). It is suspected that individuals will not immigrate between the small habitat patches through the much larger matrix of plantation.

Conservation and research recommendations: The species has been recorded from one protected area (Wolkberg Wilderness Area). Approximately half the population occurs in isolated habitat patches, so an assessment of connectivity and gene flow would be useful for providing better confidence in the assessment of extinction risk. The remaining intact portion of habitat currently not under protection should be conserved.

Family **Gekkonidae**

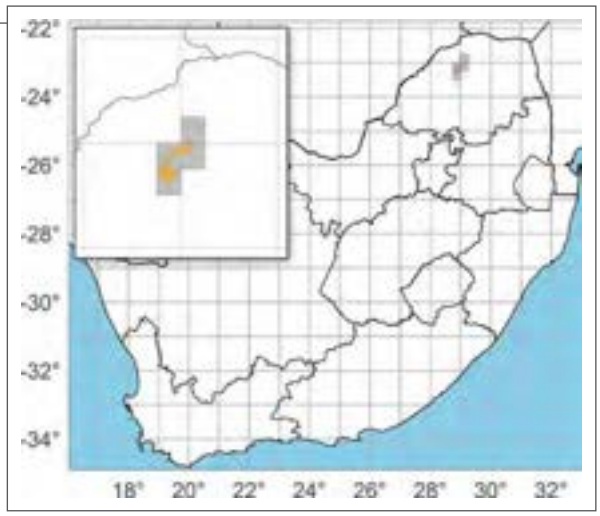
Lygodactylus montiscaeruli Jacobsen, 1992

Makgabeng Dwarf Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Data Deficient (Global IUCN assessment).
2014: Data Deficient (SARCA) as *Lygodactylus nigropunctatus montiscaeruli*.

Assessment rationale: This species has a small range on two adjacent mountains, but there are no significant known threats and habitat transformation is minimal. Previously considered Data Deficient based on an unresolved taxonomic status, new information has allowed for a full assessment.

Taxonomic notes: Previously considered a subspecies of *L. nigropunctatus*, it has subsequently been raised to a full species (Travers et al. 2014). *Other important names*: *Lygodactylus nigropunctatus montiscaeruli*.

Distribution: Occurs in the Makgabeng Hills and Blouberg, Limpopo province, South Africa. *EOO*: 755 km^2; *Distribution*: 448 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occupies cracks and cliff faces on sandstone outcrops (Jacobsen 1992a). *Habitat*: Savanna.

Threats: No significant threats known.

Population trend: The population size is assumed to be stable given that there is minimal habitat transformation within its distribution.

Conservation and research recommendations: Improved survey data supplemented by genetic analyses would provide valuable information regarding the relationship between the two subpopulations.

Lygodactylus montiscaeruli, Blouberg, Limpopo province (© R.I. Stander).

Lygodactylus montiscaeruli, Blouberg, Limpopo province (© L. Verburgt).

Family **Gekkonidae**

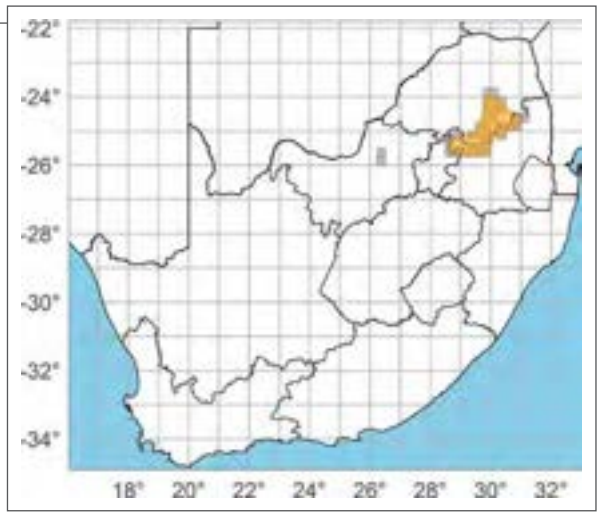
Lygodactylus nigropunctatus Jacobsen, 1992

Black-spotted Dwarf Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Lygodactylus nigropunctatus nigropunctatus*.

Assessment rationale: A fairly widespread and common species with no major threats

Taxonomic notes: The subspecies of *L. nigropunctatus* are now considered separate species (*L. incognitus* and *L. montiscaeruli* [Travers et al. 2014]). However, the apparently isolated subpopulation in North West province has not been investigated taxonomically. In addition, the range of *L. methueni* may overlap with that of *L. nigropunctatus*, and these two species can be difficult to distinguish from each other. *Other important names*: *Lygodactylus nigropunctatus nigropunctatus*.

Distribution: Widespread in southern Limpopo, northern Mpumalanga and northern Gauteng provinces, South Africa, with an apparently isolated subpopulation in northeastern North West province (Jacobsen 1992a). *EOO*: 59 000 km²; *Distribution*: 21 500 km².

Country of occurrence: South Africa.

Habitat and ecology: Rupicolous, sheltering in cracks in rock outcrops at elevations of 700–800 m a.s.l. (Jacobsen 1992a). *Habitat*: Grassland, Savanna.

Threats: There is some habitat loss in parts of the range that might have caused local declines.

Population trend: The geographic range is fairly large, and this mitigates against the negative effects of local population declines.

Conservation and research recommendations: The taxonomic status of the apparently isolated subpopulation in North West province should be evaluated.

Lygodactylus nigropunctatus, Wolkberg, Limpopo province (© J. Marais).

Family **Gekkonidae**

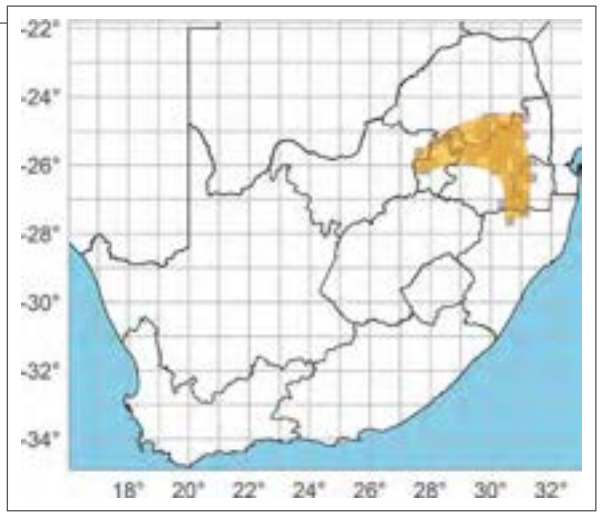
Lygodactylus ocellatus Roux, 1907

Spotted Dwarf Gecko

Regional endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Lygodactylus ocellatus ocellatus*.

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: With the elevation of *L. ocellatus soutpansbergensis* to a full species (Travers et al. 2014), there are no further taxonomic issues. *Other important names*: *Lygodactylus ocellatus ocellatus*.

Distribution: Distributed in northeastern South Africa and western Eswatini. In South Africa, it occurs throughout Gauteng and Mpumalanga provinces, extending marginally into Limpopo province in the north and KwaZulu-Natal province in the south of the range. *EOO*: 87 000 km^2; *Distribution*: 62 300 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: This rupicolous species uses rocks and rock outcrops of varying sizes and can occur in high densities on large outcrops (Jacobsen

Lygodactylus ocellatus, Sterkfontein region, Gauteng province (© G. Alexander).

Lygodactylus ocellatus, Mbabane, Eswatini (© L. Kemp).

Lygodactylus ocellatus, Belfast, Mpumalanga province (© L. Verburgt).

1989). Takes refuge in crevices between and under boulders (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: This lizard is fairly common in areas that are not heavily transformed and habitat loss is therefore not considered a significant threat.

Population trend: The large geographic range and abundance of this lizard mitigates against the negative effects of local population declines in the parts of the range that have been affected by habitat loss.

Conservation and research recommendations: No recommendations.

Family **Gekkonidae**

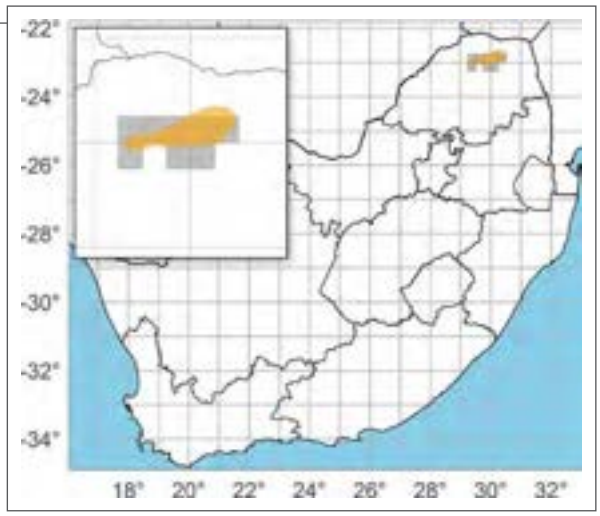
Lygodactylus soutpansbergensis Jacobsen, 1994

Soutpansberg Dwarf Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Alexander, G.J., Tolley, K.A., Conradie, W., Pietersen, D.W., Weeber, J., Bates, M.F.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA) as *Lygodactylus ocellatus soutpansbergensis*.

Reason for recent change: Non-genuine.

Assessment rationale: Has a small range but occurs in mountainous areas in which there is little habitat transformation at present. Niche modelling suggests that the range may contract by more than 75% by the year 2070. Because this species has a short generation length, suspected population declines over the three generations would not be large enough to qualify as threatened under criterion A. Previously considered Near Threatened, most of the threats listed were not plausible. In addition, a portion of the distribution is now being formally classified as a protected area, which would limit threats related to habitat transformation.

Taxonomic notes: With the elevation of *L. ocellatus soutpansbergensis* to a full species (Travers et al. 2014), there are no further taxonomic issues. *Other important names*: *Lygodactylus ocellatus soutpansbergensis*.

Distribution: This species occurs in the western and central Soutpansberg, northern Limpopo province, South Africa (Petford et al. 2019). Records of this

Lygodactylus soutpansbergensis, Lajuma, Limpopo province (© R.I. Stander).

Lygodactylus soutpansbergensis, Lajuma, Limpopo province (© L. Kemp).

species from the Blouberg (Branch 2014d; Bates & Branch 2018b) are in error. *EOO*: 3 220 km^2; *Distribution*: 2 850 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Rupicolous, living in small rock outcrops in Montane Grassland and Savanna. It is not limited to high elevations but is somewhat more cosmopolitan in its elevational range than the partially sympatric *L. incognitus* (Petford et al. 2019). While these two species have a similar climatic niche, they might partition the microhabitat to avoid competition (Petford et al. 2019). *Habitat*: Grassland, Savanna.

Threats: Based on a conservative climate change scenario, Petford and Alexander (2021a) predict a range reduction of more than 75% of the current range by the year 2070.

Population trend: Possibly in decline due to current and predicted climate change, which is likely to be causing a decrease in range size and an increase in population fragmentation.

Conservation and research recommendations: Conduct surveys to assess population trends, particularly given the predicted response to future climate change.

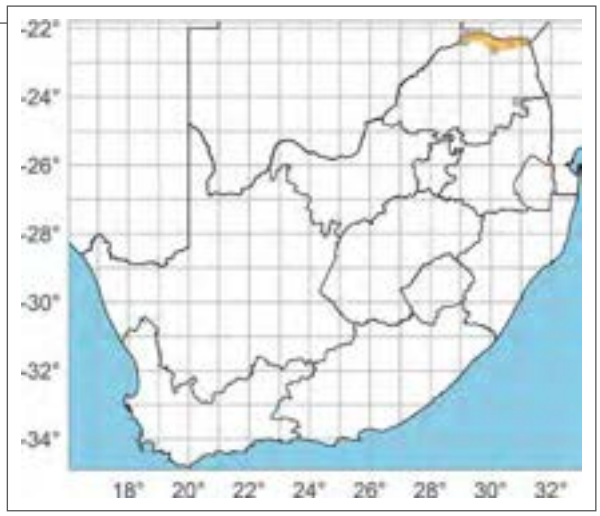
Family **Gekkonidae**

Lygodactylus stevensoni Hewitt, 1926

Stevenson's Dwarf Gecko

LC – Least Concern (Regional)

Assessors: Pietersen, D.W., Conradie, W., Weeber, J., Tolley, K.A., Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although the species has a relatively small distribution in South Africa, it is not in decline and is somewhat tolerant of habitat transformation.

Taxonomic notes: The taxonomic status of the isolated subpopulation at Lillie Nature Reserve in southern Limpopo province, South Africa, requires clarification (Jacobsen 1989). *Other important names*: none.

Distribution: Occurs in South Africa from the Limpopo River Valley, extending east into the extreme northern parts of the Kruger National Park, into southern Zimbabwe, to north of the Khami Ruins and Matobo Hills in southern Zimbabwe. An apparently isolated population occurs in Lillie Nature Reserve (Jacobsen 1989), which is 170 km south of the main distribution. *EOO*: 31 400 km^2; *Distribution*: 6 320 km^2.

Countries of occurrence: South Africa, Zimbabwe.

Habitat and ecology: Occurs in shaded crevices in sandstone and granite outcrops in wooded Savanna but may also use dead trees and the walls of buildings (Branch 1998). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Lygodactylus stevensoni, Mapungubwe, Limpopo province (© G. Alexander).

Lygodactylus stevensoni, Tshipise, Limpopo province (© C. Keates).

Lygodactylus stevensoni, Mapungubwe, Limpopo province (© G. Alexander).

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the subpopulation in Lillie Nature Reserve should be investigated, and the extent of this subpopulation's range should be quantified.

Family **Gekkonidae**

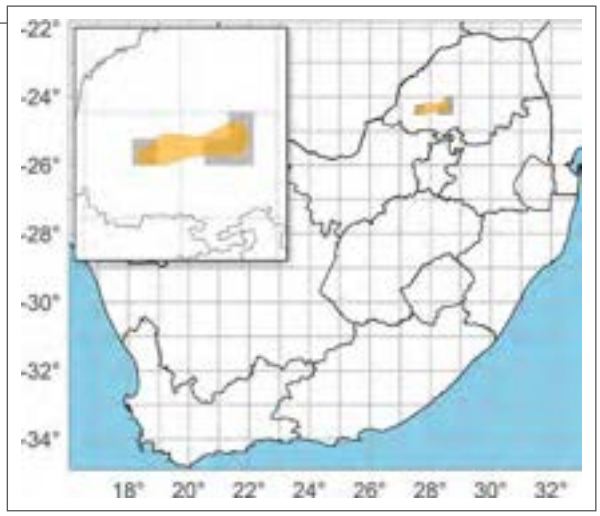
Lygodactylus waterbergensis Jacobsen, 1992

Waterberg Dwarf Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Pietersen, D.W., Conradie, W., Weeber, J., Tolley, K.A., Bates, M.F., Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Although the range of this species is small, there are no significant threats. Previously considered Near Threatened due to a restricted range, threats listed in that assessment are not plausible, and new records have extended the range to the east by approximately 30 km.

Taxonomic notes: Previously thought to occur as two isolated subpopulations (Bates & Branch 2018c), but this conclusion is likely the result of poor sampling in the intervening area rather than a true disjunction, given that the mountainous region is essentially continuous. Recent observations of this species in these intervening areas further supports the notion that the subpopulations may be connected. *Other important names*: none.

Lygodactylus waterbergensis, Marakele National Park, Limpopo province (© M. Burger).

Distribution: There are few records of this species, all of which are from the Waterberg Plateau and nearby mountains to the east, in western Limpopo province, South Africa. *EOO*: 3 570 km^2; *Distribution*: 3 040 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Rupicolous, sheltering in sandstone outcrops at elevations of 1 500–2 000 m a.s.l. (Jacobsen 1992a). *Habitat*: Grassland, Savanna.

Threats: There are no significant threats.

Population trend: Because much of the geographic range of this species is in protected areas, the population size is assumed to be stable.

Conservation and research recommendations: There is a fairly large sampling gap, and records from that region would assist to evaluate connectivity between the Waterberg Plateau and the eastern mountains.

Family **Gekkonidae**

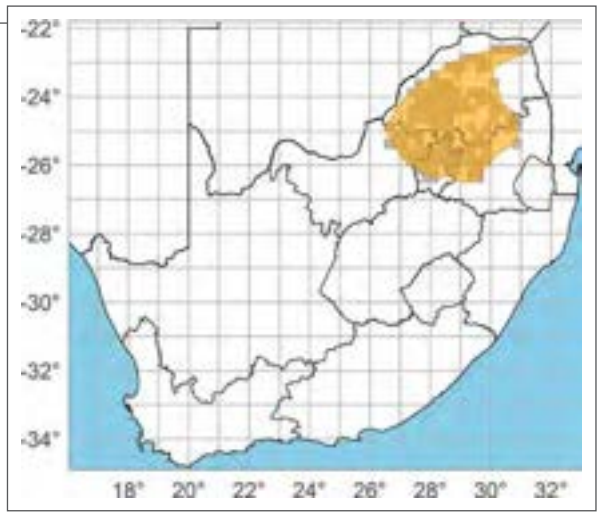
Pachydactylus affinis Boulenger, 1896

Transvaal Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant, with no major threats. Occurs in several protected areas.

Taxonomic notes: Although *P. affinis* has been shown to be genetically distinct from *P. capensis* and *P. vansoni* (Bauer & Lamb 2002), these three species can be difficult to distinguish morphologically (e.g., Jacobsen 1989). There are potentially several cryptic species within this taxon that should be investigated using a phylogenetic framework. *Other important names*: none.

Distribution: This species is widespread across most of northeastern South Africa (Jacobsen 1989). Reaches its southern limit in Gauteng province, but because there is confusion between this species and *P. capensis*, there is uncertainty in the extent of the interpreted distribution in that area. *EOO*: 144 000 km^2; *Distribution*: 127 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on rock outcrops and in moribund termitaria at elevations of 500–2 200 m a.s.l. and has also been recorded on buildings that are near to rocky outcrops (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: There are no major threats to this species, with only minimal habitat loss over most of the range. In areas that are highly urbanised (e.g., Johannesburg, Pretoria) this gecko occurs at low density.

Population trend: This is a widespread and abundant species. Although it is likely that the population has declined to an extent in some transformed areas, it is not likely that declines pose a significant risk.

Conservation and research recommendations: The validity of the potentially cryptic species should be assessed in a phylogenetic framework.

Pachydactylus affinis, Magaliesberg, Gauteng province (© L. Kemp).

Pachydactylus affinis, Magaliesberg, Gauteng province (© L. Kemp).

Family **Gekkonidae**

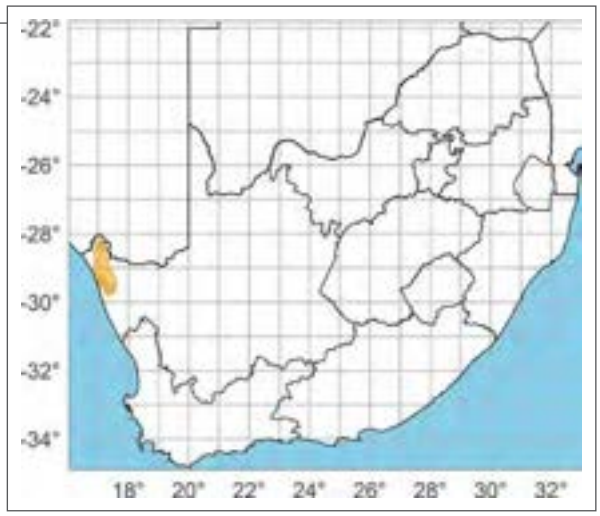
Pachydactylus amoenus Werner, 1910

Namaqua Banded Gecko

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: There are no significant threats, as there is little habitat loss within the distribution of this species.

Taxonomic notes: Some authors have treated *P. amoenus* as a subspecies of *P. mariquensis* (e.g., Kluge 2001), but the species status has been confirmed based on molecular phylogenetics and morphology (Bauer et al. 2011). *Other important names*: *Pachydactylus mariquensis*.

Distribution: Occurs in the arid regions of the extreme northwest of South Africa. *EOO*: 8 450 km^2; *Distribution*: 7 910 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in an arid region on sandy substrates. *Habitat*: Shrubland.

Threats: There are no major threats.

Population trend: In spite of the moderate-sized geographic range of this species, it occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Pachydactylus amoenus, Port Nolloth, Northern Cape province (© R.I. Stander).

Family **Gekkonidae**

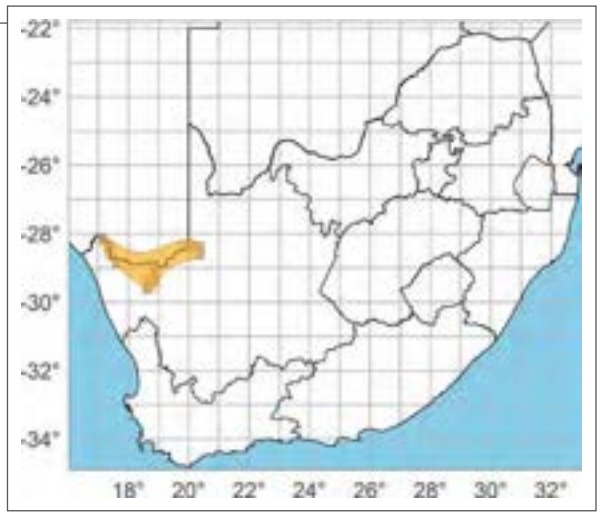
Pachydactylus atorquatus Bauer, Barts & Hulbert, 2006

Augrabies Gecko

South African near-endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a small range but occurs in an area that has not been significantly impacted by habitat loss.

Taxonomic notes: A recent phylogenetic analysis demonstrated that *P. goodi* is a junior synonym of *P. atorquatus* (Šmíd et al. 2018). These two taxa were described as separate species based on colouration pattern, but it now appears that it is a single species that contains multiple colour morphs. *Other important names*: *Pachydactylus weberi*; *Pachydactylus goodi*.

Distribution: Occurs along the Orange River Valley and surrounding mountainous regions in extreme northwestern South Africa, from the Richtersveld National Park (ReptileMap: 156833, 156955, 156956) in the west to Augrabies National Park in the east (Šmíd et al. 2018). It also occurs in the Karasburg District of Namibia at several localities (Bauer et al. 2006a; ReptileMap: https://vmus.adu.org.za). Because the recorded localities are patchy, it is not known whether the distribution is continuous or if there are multiple, isolated subpopulations. *EOO*: 36 500 km^2; *Distribution*: 25 900 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: *Pachydactylus atorquatus* occurs in barren, arid, rocky habitats at elevations of 500–800 m a.s.l. (Bauer et al. 2006a). *Habitat*: Shrubland.

Threats: Proposed mines may affect some of the Namibian subpopulations, but there are no known threats to the South African subpopulations. *Use and trade*: This species is kept and bred in captivity on a small scale in Europe and North America. It is not currently widely sold or traded, and the limited current demand may be met by captive bred animals (A.M. Bauer, pers. obs. 2009).

Population trend: In spite of the small geographic range of this species, it occurs in an area where there has been little habitat transformation and it is common. Population size is thus assumed to be stable.

Conservation and research recommendations: A better survey of the area might clarify whether there are multiple subpopulations, or if the range is continuous.

Pachydactylus atorquatus, Augrabies, Northern Cape province (© C. & S. Dorse).

Pachydactylus atorquatus, juvenile colouration, Aggeneys, Northern Cape province (© T. Ping).

Family **Gekkonidae**

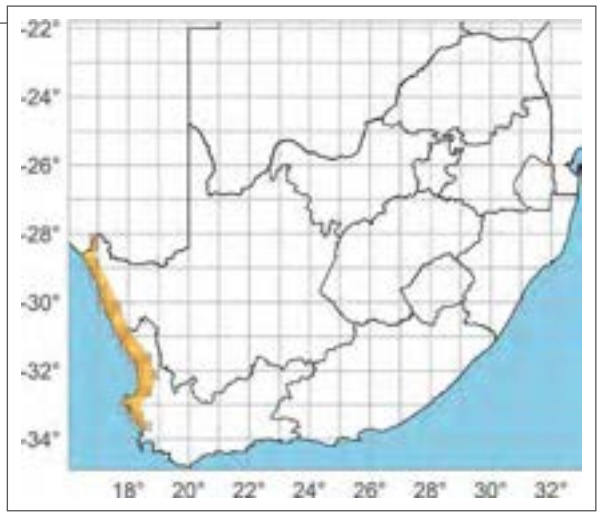
Pachydactylus austeni Hewitt, 1923

Austen's Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a large distribution and is abundant. Although there are some localised threats from habitat alteration due to mining and housing developments, this affects a small portion of the range, primarily in the south.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Distributed along the coastal regions of western South Africa, from north of Cape Town into the southern Richtersveld region (Haacke 1976c), extending up to about 50 km inland in places. Although there are records directly south of the Orange River, the species has not yet been recorded from Namibia. *EOO*: 56 000 km^2; *Distribution*: 24 100 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on loose sandy substrates primarily in sparsely vegetated coastal dunes (Branch 1998), but also alluvial sands and other sandy pockets in coastal and near-coastal habitats. It occurs mainly at elevations below 100 m a.s.l., although some localities are as high as 600 m a.s.l. *Habitat*: Shrubland.

Threats: There are no major threats.

Population trend: Although the range is not large, the species is abundant and occurs in areas that are not heavily impacted. The population is thus suspected to be stable.

Conservation and research recommendations: No recommendations.

Pachydactylus austeni, Velddrif, Western Cape province (© T. Ping).

Pachydactylus austeni, Port Nolloth, Northern Cape province (© L. Kemp).

Family **Gekkonidae**

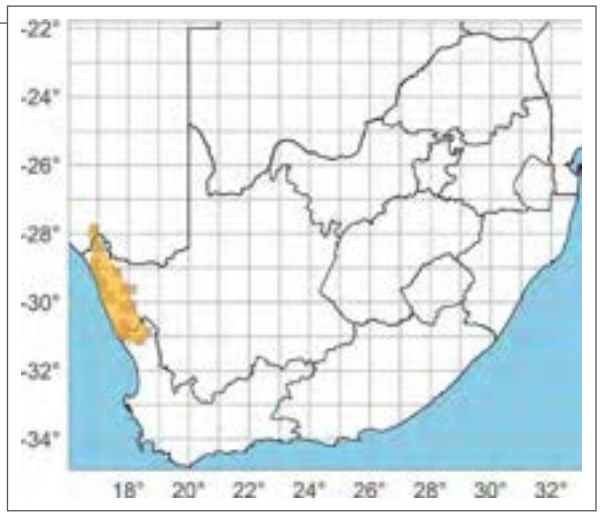
Pachydactylus barnardi FitzSimons, 1941

Barnard's Rough Gecko

South African near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Branch, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A relatively widespread and common species that occurs across a diversity of habitats and is not subject to any significant threats.

Taxonomic notes: Although historically considered a subspecies of *P. rugosus*, with its elevation to full species (Lamb & Bauer 2000a), there are no further taxonomic issues. *Other important names*: *Pachydactylus rugosus barnardi*.

Distribution: Occurs in the lowlands along the northwestern margin of South Africa from the western Richtersveld in the north to the Knersvlakte in the south (Lamb & Bauer 2000a), from the coast to about 90 km inland, extending into southern Namibia (Bauer et al. 2015). *EOO*: 31 360 km^2; *Distribution*: 27 300 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Usually associated with mesic microhabitats. It is terrestrial and found in rocky areas with succulent plants, but also in habitats fringing rivers or near the coast, from sea level to 1 200 m a.s.l. (Bauer & Branch 2001). *Habitat*: Shrubland.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Threats: There are no major threats.

Conservation and research recommendations: No recommendations.

Pachydactylus barnardi, Steinkopf, Northern Cape province (© C.R. Hundermark).

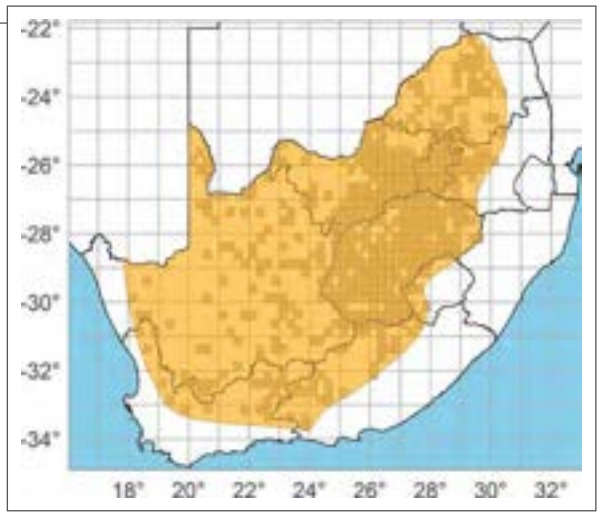
Family **Gekkonidae**

Pachydactylus capensis (Smith, 1845)

Cape Thick-toed Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant with no notable threats.

Taxonomic notes: Preliminary analyses suggest that there is genetic diversity and substructuring within *P. capensis*, possibly indicating cryptic taxa (Makhubo & Bates 2017). *Other important names*: none.

Distribution: Occurs throughout most of central and western southern Africa, including eastern Namibia (excluding the Zambezi Region [Visser 1984b]), most of Botswana (Auerbach 1987) and western Lesotho. Within South Africa it occurs widely on the central Highveld and into the more arid western interior including the Karoo and parts of the Cape Fold Mountains. Reaches its northern limit in Gauteng province, but because there is confusion between this species and *P. affinis*, there is uncertainty in the extent of the interpreted distribution in that area. A recent record (iNaturalist: 45767078) from Pietermaritzburg, KwaZulu-Natal province may represent a translocation or an atypically marked *P. vansoni*. *EOO*: 1 095 000 km²; *Distribution*: 868 000 km².

Countries of occurrence: Botswana, Lesotho, Namibia, South Africa.

Habitat and ecology: Occurs in a wide range of mostly open habitats wherever there are appropriate refugia such as rocks, disused termitaria, logs, debris

Pachydactylus capensis, Oviston Nature Reserve, Eastern Cape province (© W. Conradie).

Pachydactylus capensis, Oviston Nature Reserve, Eastern Cape province (© W. Conradie).

Pachydactylus capensis, Buffelsfontein, Penhoek Pass, Eastern Cape province (© W. Conradie).

and building material, at an elevational range of 500–1 800 m a.s.l. (Loveridge 1947; De Waal 1978; Jacobsen 1989; Branch 1998). Generally absent from extremely mesic areas and true desert. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species. This gecko appears to be somewhat tolerant of urbanisation (e.g., Johannesburg, Pretoria).

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with large parts of the range that are not impacted by habitat transformation.

Conservation and research recommendations: In-depth phylogenetic analyses are required to assess the taxonomic status of the different clades within this species.

Family **Gekkonidae**

Pachydactylus carinatus Bauer, Lamb & Branch, 2006

Richtersveld Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.

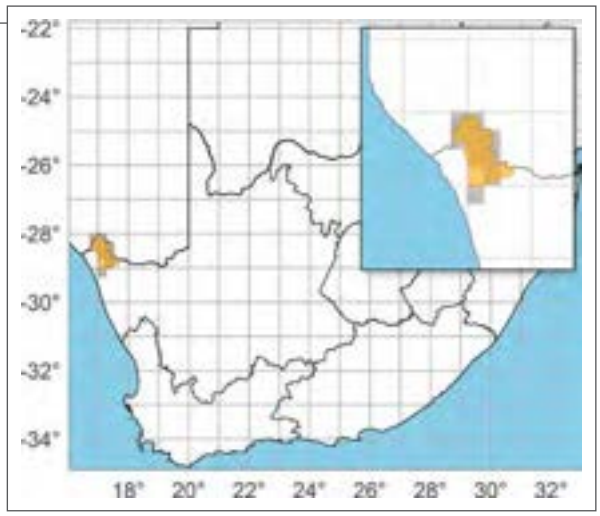
Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a restricted range but is abundant, there are no notable threats and most of the range falls within protected areas.

Taxonomic notes: This species is part of the *P. serval* group (Bauer et al. 2006b). Older references to *P. serval* and *P. onscepensis* from the lower Orange River Valley west of Goodhouse (e.g., McLachlan & Spence 1966) may be referable to *P. carinatus*. The identity of a population of geckos at Koboop near Onseepkans, tentatively referred to *P. carinatus* by Bauer et al. (2006b), requires verification. *Other important names*: none.

Distribution: In South Africa, it is limited to the Richtersveld and lower Orange River Valley of the Northern Cape province, while in Namibia it occurs in the Karasburg and Lüderitz regions (Bauer et al. 2006b). *EOO*: 6 530 km²; *Distribution*: 4 920 km².

Countries of occurrence: Namibia, South Africa.



Habitat and ecology: Occurs in relatively mesic habitats in river valleys or on rocky mountain slopes in otherwise arid areas, at elevations of 40–720 m a.s.l. (Bauer et al. 2006b). *Habitat*: Shrubland, Desert.

Threats: There are no substantial threats to this species.

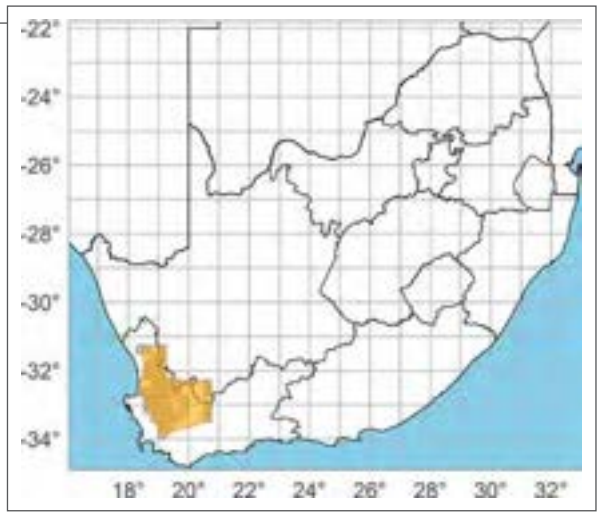
Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: Surveys should be undertaken at Koboop near Onseepkans to verify whether this species occurs there.

Pachydactylus carinatus, Bladgrond, Northern Cape province (© C.R. Hundermark).

Pachydactylus formosus Smith, 1849

Southern Rough Gecko



South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species that occurs in several protected areas, with no major threats.

Taxonomic notes: Although historically considered a subspecies of *P. capensis* (Hewitt 1927) and *P. rugosus* (McLachlan 1979), *P. formosus* has since been elevated to a full species (Lamb & Bauer 2000b). There are no further taxonomic issues. *Other important names*: *Pachydactylus rugosus formosus*.

Distribution: Occurs in southwestern South Africa, throughout the northern Cape Fold Mountains of the Western Cape province and some neighbouring lowlands, and marginally into the Northern Cape province. *EOO*: 47 300 km^2; *Distribution*: 38 700 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Usually associated with mesic Fynbos habitats where there are rocky crevices for retreats. Especially common in montane habitats at elevations up to 2 000 m a.s.l. but also occurs near sea level where river gorges, rock cuttings and low hills provide suitable rocky habitat (Branch 1998; Lamb & Bauer 2000b). *Habitat*: Shrubland.

Threats: There are no major threats.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Pachydactylus formosus, Cederberg, Western Cape province (© L. Kemp).

Family **Gekkonidae**

Pachydactylus geitje (Sparrman, 1778)

Ocellated Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.

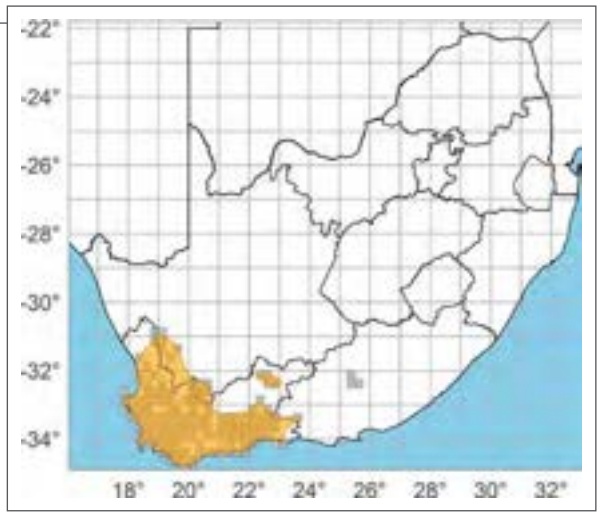
Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Fairly widespread and locally abundant with no significant threats.

Taxonomic notes: *Pachydactylus monticolus* Fitz-Simons, 1943 is considered a junior synonym of *P. geitje* and is in reference to high elevation subpopulations (McLachlan in Branch 1981; Branch et al. 1988; Branch & Bauer 1995). Recent phylogenetic analyses suggest that there are divergent clades that may represent cryptic species (Skinner 2016). *Other important names*: *Pachydactylus bergii*; *Pachydactylus monticolus*.

Distribution: This gecko is widespread in the south-western regions of South Africa, throughout most of the Cape Fold Mountains and adjacent low-lying regions (Visser 1984c; Branch 1998). There is a potentially isolated subpopulation along the Great Escarpment, but the species could be more widespread there. *EOO*: 208 000 km²; *Distribution*: 103 000 km².

Country of occurrence: South Africa.



Habitat and ecology: Occurs in semi-mesic to semi-arid areas over a wide elevational range, from sea level to at least 2 000 m, wherever suitable rock, vegetation or debris provide retreat sites (Branch & Bauer 1995; Branch 1998). *Habitat*: Shrubland.

Threats: There has been habitat loss due to urbanisation and agriculture in some parts of the range, such as around Cape Town. It does not occur in heavily urbanised areas but persists in green belts and parks.

Population trend: Although some parts of the range have been transformed, the extent of habitat transformation is small in relation to the large range of this species. It is thus assumed that any local population declines do not pose a threat to the species.

Conservation and research recommendations: The taxonomic status of the potentially cryptic species should be investigated.

Pachydactylus geitje, Baviaanskloof, Eastern Cape province (© C. Keates).

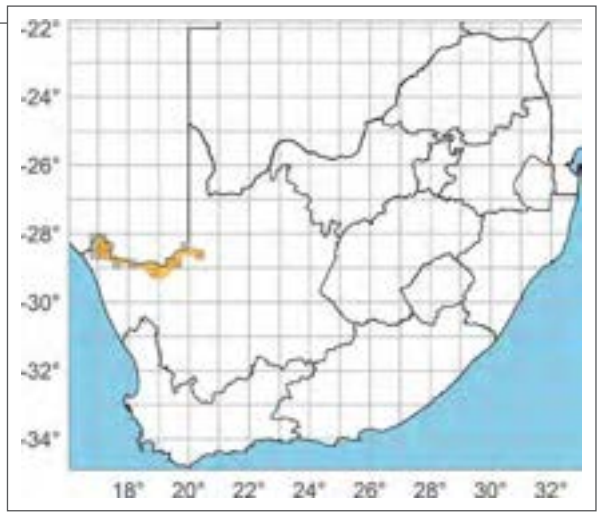
Pachydactylus geitje, Stellenbosch, Western Cape province (© L. Kemp).

Pachydactylus haackei Branch, Bauer & Good, 1996

Haacke's Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, occurring mostly in areas with little human impact.

Taxonomic notes: No taxonomic issues. This species is, however, easily confused with *P. namaquensis* (Branch et al. 1996; Bauer & Branch 2001) particularly where their ranges overlap near the Richtersveld National Park. *Other important names*: none.

Distribution: Fairly widespread in southern Namibia, entering South Africa in the Northern Cape province along the Orange River Valley (Branch et al. 1996; Barts et al. 2005) and extending southwards as far as the Aggeneys region. *EOO*: 22 700 km^2; *Distribution*: 6 560 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Rupicolous, using rock outcrops and rock faces with deep cracks, occurring at elevations of 100–1 200 m a.s.l. (Branch et al. 1996; Barts 2002). *Habitat*: Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this gecko occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: No recommendations.

Pachydactylus haackei, Tantalite Valley, southern Namibia (© L. Kemp).

Pachydactylus haackei, Augrabies, Northern Cape province (© C. & S. Dorse).

Family **Gekkonidae**

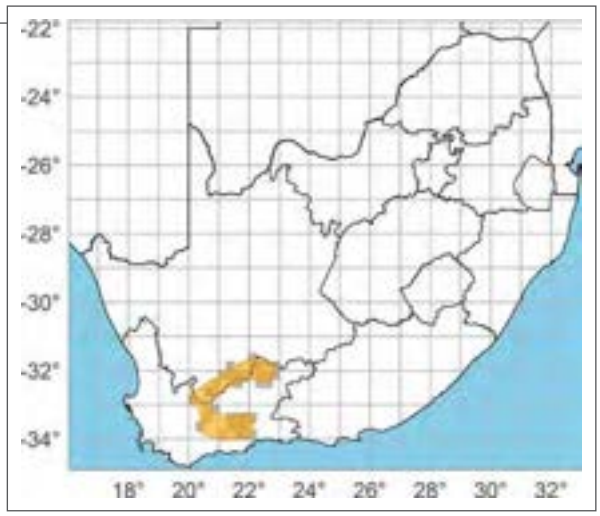
Pachydactylus kladaroderma Branch, Bauer & Good, 1996

Thin-skinned Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: *Pachydactylus kladaroderma* has a large range in largely inaccessible montane habitats that are not under any major threat.

Taxonomic notes: Historical literature records of *P. namaquensis* from the Western Cape province and southern Northern Cape province are referable to *P. kladaroderma*. *Other important names*: *Pachydactylus namaquensis*.

Distribution: Occurs in the western Cape Fold Mountains and western extent of the Great Escarpment, into the Great Karoo (Branch et al. 1996; Telford et al. 2022). *EOO*: 48 100 km^2; *Distribution*: 30 500 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in semi-mesic Fynbos and arid Karoo habitats at elevations of 750–1 700 m a.s.l., on large rock outcrops where it shelters in deep horizontal cracks (Branch & Bauer 1995; Branch et al. 1996). *Habitat*: Shrubland.

Threats: There are no major threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Pachydactylus kladaroderma, Karoo National Park, Western Cape province (© W. Conradie).

Family **Gekkonidae**

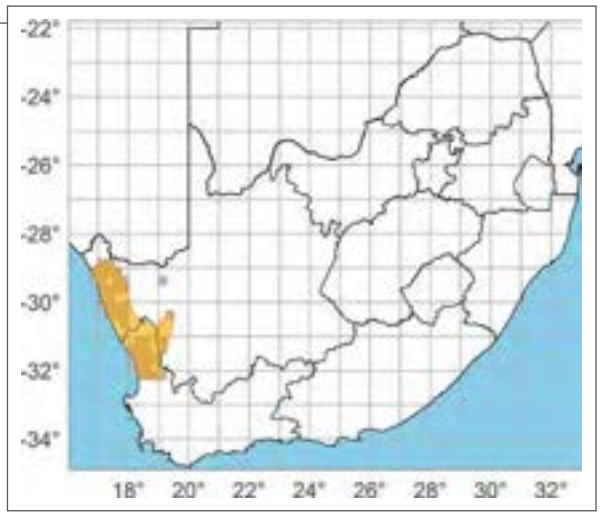
Pachydactylus labialis FitzSimons, 1938

Western Cape Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, M.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no significant threats.

Taxonomic notes: Records of *P. capensis* from the west coast of South Africa are generally referable to *P. labialis*. There is significant morphological variation within the species and further study is required to assess any possible taxonomically significant substructuring of subpopulations. *Other important names*: none.

Distribution: Occurs along the inland, western margin of South Africa from the Ceres Karoo northwards to the Richtersveld National Park (Bauer & Branch 2001). *EOO*: 65 000 km²; *Distribution*: 40 100 km².

Country of occurrence: South Africa.

Habitat and ecology: This species occurs in semi-arid habitats that provide suitable rocky or vegetative ground cover. It has been recorded from Succulent Karoo, Nama-Karoo and Fynbos habitats with sandy substrates, from sea level to about 800 m a.s.l. (Branch 1998; Bauer & Branch 2001). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Pachydactylus labialis, Koingnaas, Northern Cape province (© L. Kemp).

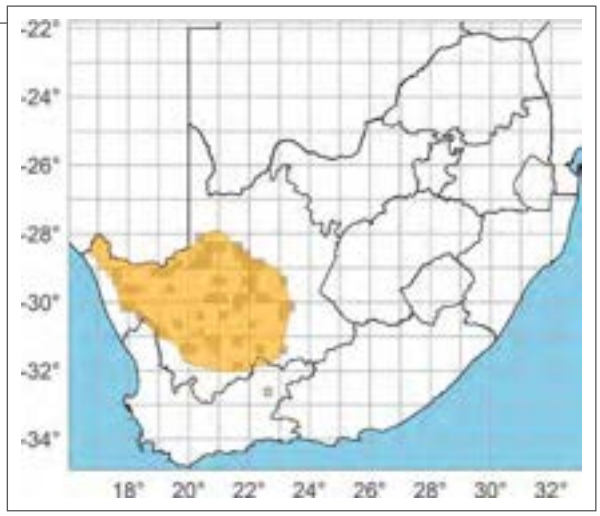
Family **Gekkonidae**

Pachydactylus latirostris Hewitt, 1923

Quartz Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, occurring in areas with little habitat transformation. There are no significant threats.

Taxonomic notes: *Pachydactylus latirostris* possibly represents a species complex on the basis of high genetic sequence divergence values within the clade, especially for populations in Namibia. The South African population appears to be assignable to a single clade (Bauer et al. 2011). *Other important names*: *Pachydactylus mariquensis latirostris*.

Distribution: Occurs throughout much of northwestern South Africa across most of the Northern Cape province. There is a single outlying record to the south, near Beaufort West, suggesting that it could occur more extensively in the Western Cape province. In Namibia it occurs as far north as Windhoek and Swakopmund (Bauer et al. 2011). *EOO*: 224 000 km^2; *Distribution*: 183 000 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Uses sandy soils and sparse vegetation in several habitat types, such as sand plains and dry riverbeds, from near sea level to at least 1 500 m elevation (Branch 1998). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Occurs mainly in arid regions that have not been significantly impacted by habitat transformation. Thus, the population size is not thought to have declined.

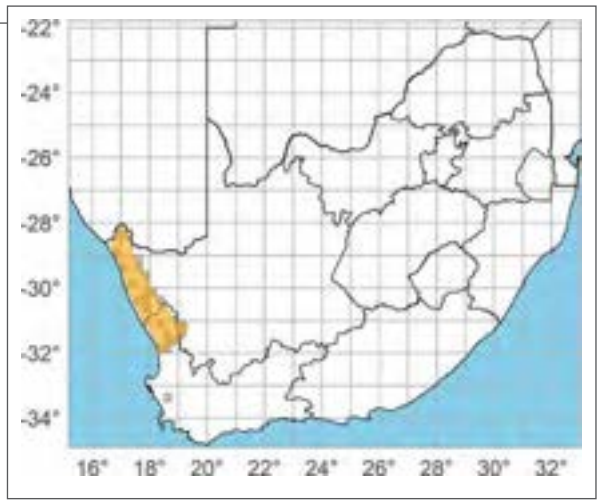
Conservation and research recommendations: An in-depth phylogenetic analysis is required to assess the taxonomic status of the divergent clades in Namibia, and the occurrence in the Western Cape province requires confirmation.

Pachydactylus latirostris, Springbok, Northern Cape province (© L. Kemp).

Family **Gekkonidae**

Pachydactylus macrolepis FitzSimons, 1939

Large-scaled Banded Gecko



South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a moderate-sized distribution with minimal habitat transformation. It occurs in several protected areas and there are no significant threats or population declines.

Taxonomic notes: Although the taxonomic history of this species has been unstable, it was confirmed as a valid species (Bauer et al. 2011). There appears to be some confusion with *P. mariquensis* in the south of the range and the diagnostic morphological features used to identify these species are unclear (Da Silva et al. 2019). *Other important names*: none.

Distribution: Distributed in northwestern South Africa from the coastal regions to approximately 60 km inland. There are few records of this species, so the distribution is not well-known. A record 135 km south of the distribution previously mapped (Bates 2014a) has been genetically identified as *P. macrolepis* although that individual was previously identified as *P. mariquensis* based on morphology (Da Silva et al. 2019). *EOO*: 41 900 km^2; *Distribution*: 31 300 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Although there are few records of this species, it appears to occur in arid regions with sandy soils. *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: Improved distribution data and an evaluation of morphological features that overlap with *P. mariquensis* would be useful for assessing the species' range.

Pachydactylus macrolepis, Springbok, Northern Cape province (© G.K. Nicolau).

Family **Gekkonidae**

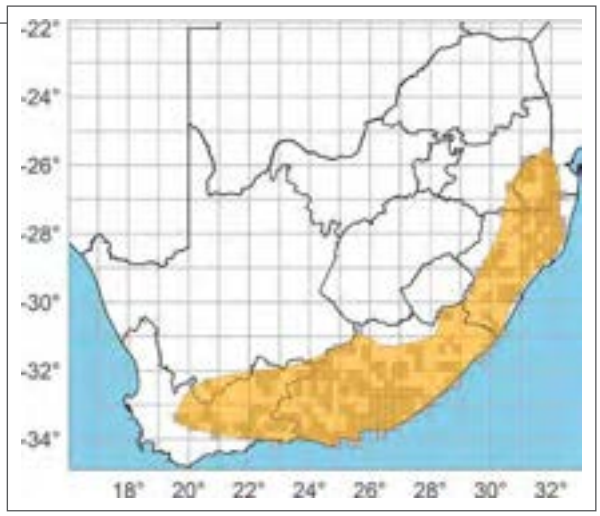
Pachydactylus maculatus Gray, 1845

Spotted Gecko

Regional near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no significant threats.

Taxonomic notes: *Pachydactylus maculatus* has a wide distribution within which there is genetic variation (Skinner 2016), which could indicate that there are cryptic species. *Other important names*: none.

Distribution: Widespread along the eastern margin of southern Africa, from southern Mozambique into South Africa and Eswatini. In South Africa it occurs from KwaZulu-Natal province southwards along the eastern and southern margin of the country to the eastern portions of the Western Cape province. It is also recorded from St Croix Island in Algoa Bay. *EOO*: 522 000 km^2; *Distribution*: 314 000 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa.

Habitat and ecology: Occurs in a broad range of habitats in mesic areas where it shelters under rocks, in old termitaria, under logs or debris (Branch & Braack 1987). The elevational range is from sea level to 1 600 m a.s.l. *Habitat*: Savanna, Shrubland, Grassland.

Threats: There are no significant threats to this species.

Population trend: Although there is some habitat modification across the range, it is widespread and abundant, which mitigates against the negative effects of local population declines.

Conservation and research recommendations: An assessment of the potentially cryptic species is needed.

Pachydactylus maculatus, Beaufort West, Western Cape province (© L. Verburgt).

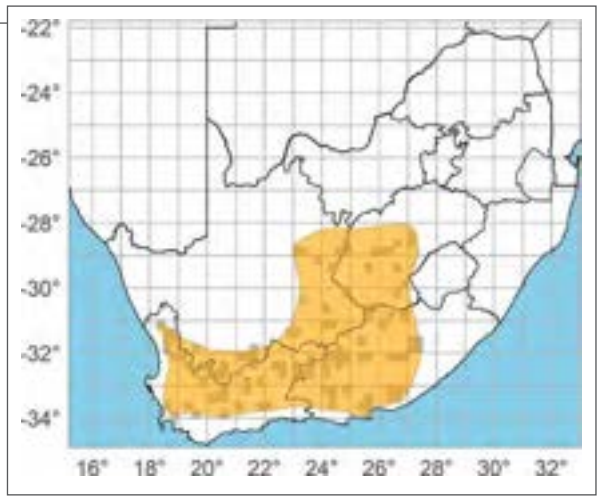
Pachydactylus mariquensis Smith, 1849

Common Banded Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: No taxonomic issues, although there has been some confusion with *P. latirostris* where their distributions overlap (Da Silva et al. 2019). *Other important names*: none.

Distribution: This species is widespread across the arid central areas of South Africa, extending south into the Cape Fold Mountains. *EOO*: 468 000 km^2; *Distribution*: 405 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in arid and mesic habitats such as Karoo, Savanna and Fynbos where there is sparsely vegetated sandy or gravelly soils (Branch & Braack 1987, 1989; Branch & Bauer 1995; Bauer & Branch 2001). The elevational range is from near sea level to at least 1 500 m a.s.l. *Habitat*: Shrubland, Grassland.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas where there is relatively little habitat transformation.

Conservation and research recommendations: No recommendations.

Pachydactylus mariquensis, Graaff-Reinet, Eastern Cape province (© T. Ping).

Family **Gekkonidae**

Pachydactylus monicae Bauer, Lamb & Branch, 2006

Monica's Gecko

LC – Least Concern (Regional)

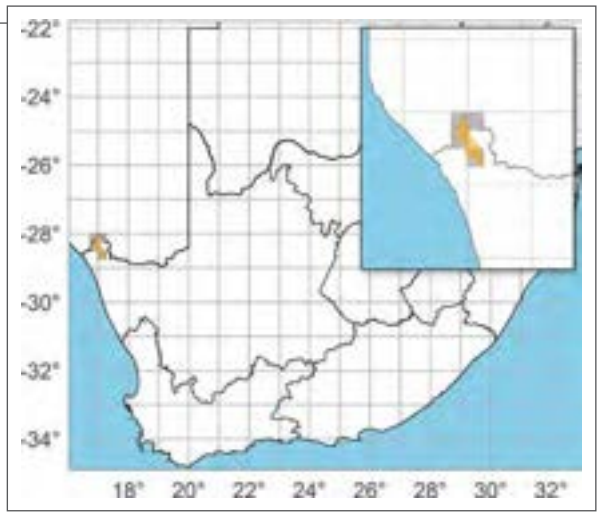
Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a small range in South Africa but is abundant and occurs in areas that are not impacted by land transformation. Most of the distribution is in protected areas or in buffer zones of diamond mining areas, where it also receives *de facto* protection. This gecko is also tolerant of moderate levels of disturbance and has been recorded around human habitations (Bauer & Branch 2001; Bauer et al. 2006b).

Taxonomic notes: This species is part of the *P. weberi* group (Bauer et al. 2006b). Some old records of *P. weberi* from the Richtersveld and adjacent southern Namibia may be referable to *P. monicae* (e.g., Bauer & Branch 2001). *Other important names*: none.

Distribution: Occurs in the lower Orange River Valley in the Northern Cape province of South Africa, extending northwards to the Lüderitz and Karasburg districts of Namibia (Bauer et al. 2006b). All known localities are in the lower Orange River Valley, lower Fish River Valley and Holoog River Valley, or in the plains and hills west of the Huib-Hoch Plateau (Bauer et al. 2006b). *EOO*: 1 450 km²; *Distribution*: 1 160 km².



Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Within the overall arid landscape, this gecko uses relatively mesic microhabitats close to major rivers and on adjacent boulder outcrops. Occurs mainly at elevations below 100 m a.s.l., but also on the lower slopes of mountains (< 900 m a.s.l.; Bauer et al. 2006b). *Habitat*: Shrubland.

Threats: There are no notable threats.

Population trend: This gecko is abundant in areas that have been well surveyed (Bauer et al. 2006b) and occurs mainly in arid regions that have not been significantly impacted by habitat transformation. Thus, the population size is not thought to have declined.

Conservation and research recommendations: No recommendations.

Pachydactylus monicae, Potjiespram, Richtersveld, Northern Cape province (© J. Marais).

Family **Gekkonidae**

Pachydactylus montanus Methuen & Hewitt, 1914

Namaqua Mountain Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with only very localised threats of mining in scattered areas.

Taxonomic notes: *Pachydactylus montanus* is sympatric with *P. purcelli* and *P. serval* in southern Namibia and with *P. purcelli* in the Northern Cape province, South Africa. The morphological similarity between these species could lead to confusion, resulting in erroneous identifications. *Other important names*: none.

Distribution: Distributed mainly in the lower Orange River Valley in South Africa, becoming more widespread in southern Namibia (Bauer et al. 2006b). There is an isolated population in southern Namibia (30 km east of Aus; Farm Houmoed, Tirasberg Mountains), and an isolated record from near the coast in the northwestern Northern Cape province approximately 100 km south of the remainder of the range, north of Wallekraal requires verification and has not been mapped (Bauer et al. 2006b). *EOO*: 44 600 km²; *Distribution*: 21 900 km².

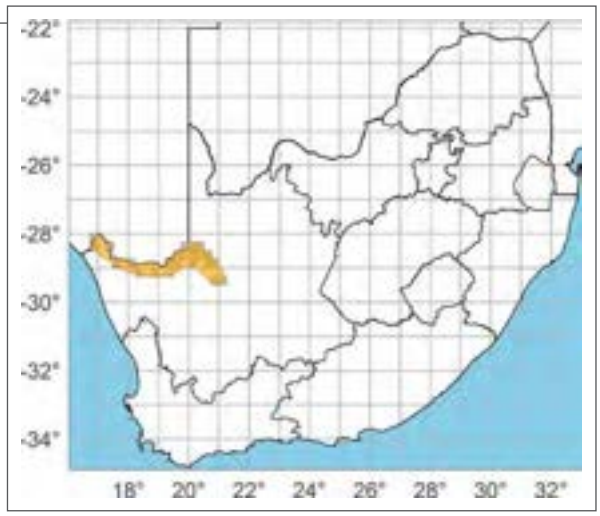
Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in rocky habitats in semi-arid to arid regions, from near sea level to the top of the Great Karas Mountains in Namibia at 2 225 m a.s.l. (Methuen & Hewitt 1914). *Habitat*: Shrubland, Desert.

Threats: There are no significant threats to this species.

Population trend: Because this gecko occurs mainly in arid regions that have not been substantially impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: The distribution of isolated populations in southern Namibia and the Northern Cape province of South Africa require further assessment.



Pachydactylus montanus, Tantalite Valley, southern Namibia (© L. Kemp).

Pachydactylus montanus, Kakamas, Northern Cape province (© L. Kemp).

Family **Gekkonidae**

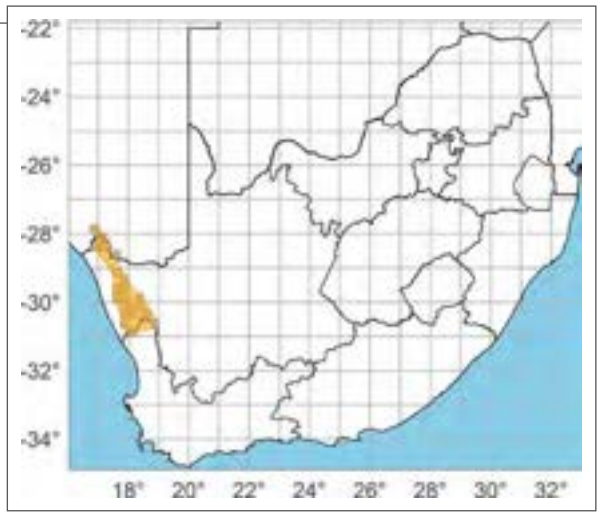
Pachydactylus namaquensis (Sclater, 1898)

Namaqua Gecko

South African near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a fairly large distribution that is not heavily impacted by habitat transformation, with much of its range in protected areas.

Taxonomic notes: There are no taxonomic issues at present. Where *P. namaquensis* and *P. haackei* are sympatric (in the Richtersveld area), there might be confusion in the assignment of records. *Other important names*: none.

Distribution: Distributed in northwestern South Africa, extending marginally into southern Namibia. In South Africa, it extends south to the Kamiesberg. There is a single record in Namibia from the Namuskluft Inselberg approximately 20 km north of the South African border (Branch et al. 1996; Bauer & Branch 2001). *EOO*: 26 450 km²; *Distribution*: 21 400 km².

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: This rupicolous species inhabits large rock outcrops with deep cracks in relatively mesic microhabitats. Elevational range is approximately 500–1 500 m a.s.l. (Branch et al. 1996; Bauer & Branch 2001). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: This species appears to be present throughout suitable rocky habitats, which are widespread across its distribution (Branch et al. 1996). It is not considered to be in decline as it has a widespread distribution in an area where habitat modification is minimal.

Conservation and research recommendations: An improved estimate of the Namibian portion of the distribution is needed. Specimens from the contact zone with *P. haackei* should be re-examined to confirm their taxonomic assignment.

Pachydactylus namaquensis, Springbok, Northern Cape province (© L. Kemp).

Family **Gekkonidae**

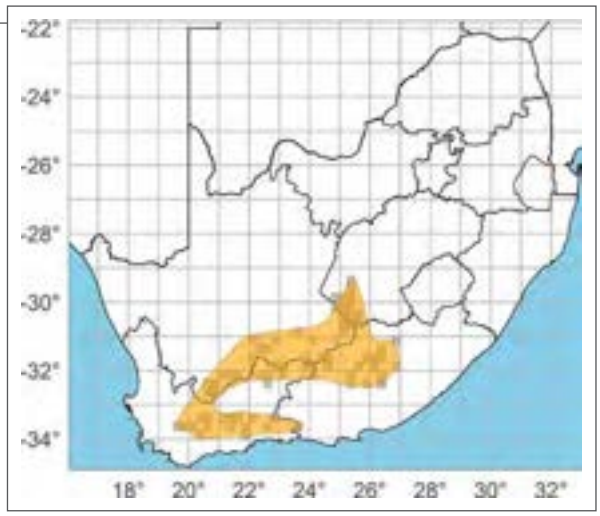
Pachydactylus oculatus Hewitt, 1927

Golden Spotted Gecko

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, occurring mainly in areas without major anthropogenic disturbances.

Taxonomic notes: *Pachydactylus oculatus* is sometimes confused with its sister species, *P. maculatus*, and records from their area of sympatry on the Great Escarpment of South Africa require verification. *Other important names*: none.

Distribution: Occurs across the south-central part of South Africa, with most records from the Cape Fold Mountains, the Great Escarpment and the Great Karoo. *EOO*: 201 000 km^2; *Distribution*: 133 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in semi-arid rocky habitats and mountainous terrain at elevations of 800–2 000 m a.s.l. (De Waal 1978: Branch & Braack 1989). *Habitat*: Shrubland, Grassland.

Threats: There are no significant threats to this species.

Population trend: The species is not considered to be in decline as it has a widespread distribution in an area where habitat modification is minimal.

Conservation and research recommendations: Confirmation of the extent of distribution along the Great Escarpment is needed.

Pachydactylus oculatus, Colesberg, Northern Cape province (© L. Kemp).

Pachydactylus oculatus, Nieu-Bethesda, Eastern Cape province (© T. Ping).

Family **Gekkonidae**

Pachydactylus punctatus Peters, 1854

Speckled Gecko

LC – Least Concern (Regional)

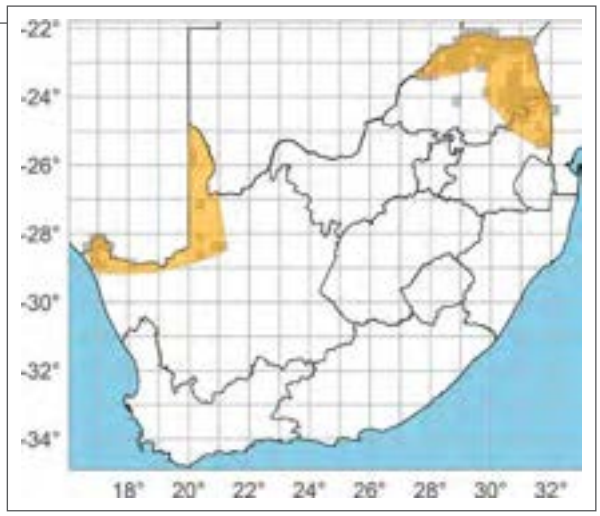
Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, with no significant threats.

Taxonomic notes: There is extensive, geographically correlated colour pattern variation within this species (Bauer & Branch 1995) that warrants further investigation (Heinz 2011). *Other important names*: none.

Distribution: Occurs across much of southern Africa, continuously from southern Angola and western Namibia (excluding the Namib and pro-Namib desert), across Botswana and Zimbabwe to northern Mozambique extending as far as northern Malawi (Broadley 2003). There is an apparently isolated subpopulation in southern Democratic Republic of the Congo (De Witte 1953). The distribution extends into South Africa from the north in two areas – the Northern Cape province at the Richtersveld, adjacent lower Orange River Valley and the Kalahari, and in northeastern Limpopo and Mpumalanga provinces. In the northeast, there are isolated, confirmed records about 100 km south of the main distribution. There are a few recent citizen science records that are up to about 200 km south of the main distribution in the Northern Cape province that require verification. These are not included as part of the interpreted distribution. *EOO*: 617 000 km²; *Distribution*: 128 000 km².



Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Chiefly tropical, occupying a diverse array of open habitats from grassy Savanna to Desert margins to dry riverbeds. Occurs from sea level to at least 1 800 m a.s.l. (100–1 500 m a.s.l. in South Africa [Bauer & Branch 1995]). *Habitat*: Savanna, Shrubland, Desert.

Pachydactylus punctatus, Vivo, Limpopo province (© C. & S. Dorse).

Pachydactylus punctatus, Pafuri, Kruger National Park, Limpopo province (© C. Keates).

Pachydactylus punctatus, southern Namibia (© G. Alexander).

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs largely in areas that are not impacted by habitat transformation.

Conservation and research recommendations: Taxonomic studies should be undertaken to assess whether the different colour forms represent separate taxa, and the distribution and/or taxonomic status of the isolated population in southern Democratic Republic of the Congo should also be assessed.

Family **Gekkonidae**

Pachydactylus purcelli Boulenger, 1910

Purcell's Gecko

South African near-endemic

LC – Least Concern (Global)

Assessors: Alexander, G.J., Bates, M.F., Bauer, A.M., Tolley, K.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no significant threats.

Taxonomic notes: No notable issues. *Other important names*: *Pachydactylus serval purcelli*.

Distribution: Occurs widely in western South Africa and southeastern Namibia (Bauer et al. 2006b). In Namibia it occurs as far north as the Karas Mountains in the Karasburg and Keetmanshoop districts. In South Africa it occurs from just north of the Cape Fold Mountains extending northwards to the Orange River Valley, and just entering the Eastern Cape province in the east. The isolated record near Springbok in the Northern Cape province (Carolusberg), approximately 120 km to the west of the main distribution (Bauer et al. 2006b) has been included in the EOO but not included in the interpreted distribution. *EOO*: 274 900 km^2; *Distribution*: 217 700 km^2.

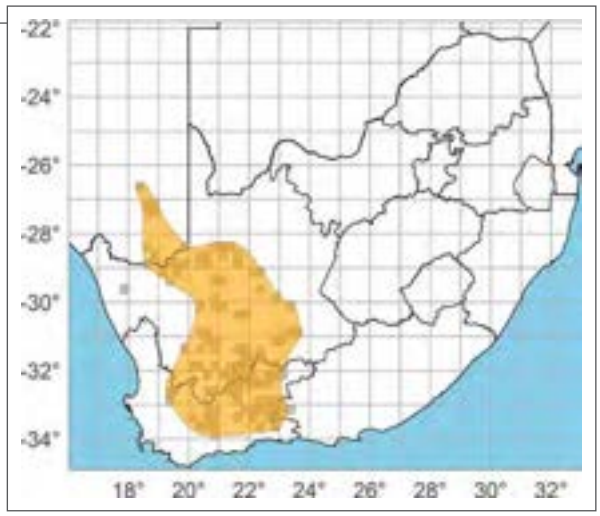
Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in rocky habitats in semi-arid regions and riverine corridors in arid regions, chiefly from 450 to 1 800 m a.s.l. (Bauer et al. 2006b). *Habitat*: Shrubland, Desert.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: Confirmation is needed for the extent of the distribution in northern South Africa around the Springbok area.



Pachydactylus purcelli, Beaufort West, Western Cape province (© L. Kemp).

Pachydactylus purcelli, Laingsburg region, Western Cape province (© C. & S. Dorse).

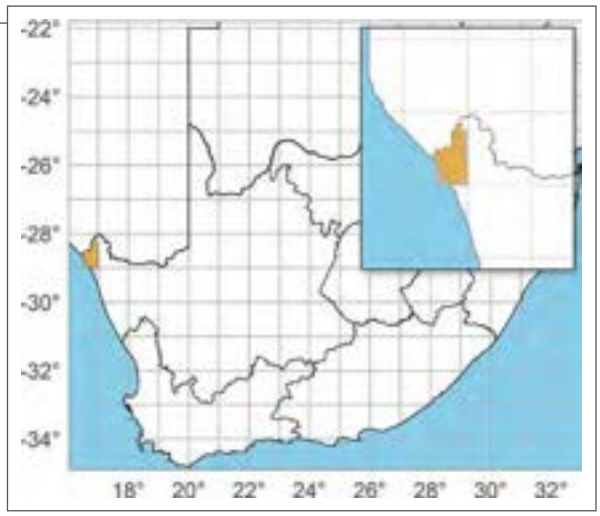
Family **Gekkonidae**

Pachydactylus rangei (Andersson, 1908)

Namib Web-footed Gecko

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Weeber, J., Conradie, W., Pietersen, D.W., Alexander, G.J., Bauer, A.M.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Critically Endangered (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This gecko has a small distribution regionally, within which there is some habitat loss due to mining along the coast, but this is minor. The most recent national land cover data shows that only ± 7% of the range has been transformed. Globally, this gecko is widely distributed, abundant and not under any significant threats. It is suspected that the regional subpopulation is not isolated from the larger Namibian subpopulation(s) and that immigration occurs between the two. Although the Orange River forms a border between South Africa and Namibia, it is assumed that this is not a significant barrier to immigration.

Regionally, this species was formerly assessed as Critically Endangered (Bauer 2014a) due to an 80% decline in the population due to habitat loss, partly inferred by the lack of modern-day records. However, examination of the most recent national land cover spatial data shows that the habitat loss is minor, and there have been several recent records (https://inaturalist.org; https://vmus.adu.org.za). Therefore, the estimate of an 80% population decline cannot be supported. Furthermore, the previous assessment was

Pachydactylus rangeri, Gobabeb, Namibia (© G. Alexander).

Family Gekkonidae

not carried in accordance with the IUCN guidelines for Regional Assessments (IUCN 2012) whereby an evaluation of connectivity to the Namibian (global) population was required, necessitating a downlisting adjustment (IUCN 2012). Thus, the 2014 regional assessment is not applicable.

Taxonomic notes: The close relationship of this species to *P. austeni* was confirmed by DNA-based phylogenetic analysis (Bauer & Lamb 2005; Lamb & Bauer 2006), and the genus *Palmatogecko* was formally synonymised with *Pachydactylus* by Bauer and Lamb (2005). There are no further taxonomic issues. *Other important names*: *Palmatogecko rangei*.

Distribution: Regionally, this gecko has a small range in the northwest of South Africa, in the hyper-arid region south of the Orange River, from the coastal dunes, extending more than 40 km inland into the Richtersveld. Globally, this gecko is widely distributed along the coastal parts of southern Angola (Namibe Province) and Namibia, to extreme northwestern South Africa (Branch 1998; Griffin 2003; Marques et al. 2018). *EOO*: 3 250 km^2; *Distribution*: 2 600 km^2.

Countries of occurrence: Angola, Namibia, South Africa.

Threats: No significant threats, although some habitat along the coastal portion of the range has been impacted by mining (approximately 7% of the range).

Population trend: Although some declines have likely occurred along the coastal parts of the range, the remainder of the population is likely to be stable at present given that impacts across the range are proportionally small. In addition, the regional subpopulation is suspected to be continuous with the Namibian subpopulation, where this gecko is widespread and abundant. Despite this, it occurs in an area that has been impacted by long-term drought and this, along with the predicted negative effects of climate change in this region (Engelbrecht et al. 2015), may be an emerging threat.

Habitat and ecology: This gecko occurs on loose sands and aeolian dunes in the hyper-arid regions, including the Namib Desert. It has been recorded from sea level to about 250 m a.s.l. They shelter underneath the sands during the day, moving over the sands at night to forage (Branch 1998). *Habitat*: Desert.

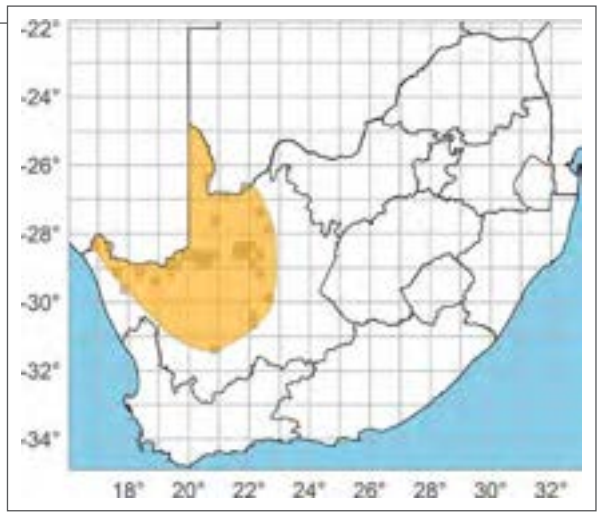
Conservation and research recommendations: No recommendations.

Pachydactylus rugosus Smith, 1849

Rough-scaled Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common and not subject to any notable threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs in South Africa, southwestern Botswana (Auerbach 1987), large parts of Namibia (Visser 1984d) and southern Angola (Branch et al. 2019a). Within South Africa it occurs in the Northern Cape province (see Telford et al. 2022) in the Great Karoo, extending north to the Orange River. *EOO*: 278 000 km²; *Distribution*: 188 000 km².

Countries of occurrence: Angola, Botswana, Namibia, South Africa.

Habitat and ecology: Shelters under bark on dead trees or in association with dry, dead, fallen or standing trees, under debris in areas of human activity (Bauer & Branch 2001) and near rocky ridges. It occurs from near sea level to at least 1 500 m a.s.l. *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread, common species that occurs in areas that are not heavily impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Pachydactylus rugosus, Williston, Northern Cape province (© C.R. Hundermark).

Pachydactylus rugosus, Aggeneys, Northern Cape province (© L. Kemp).

Family **Gekkonidae**

Pachydactylus tigrinus Van Dam, 1921

Tiger Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant, occurring in several protected areas. There are no significant threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Widespread in southern Africa, where it occurs throughout much of Zimbabwe, in west-central Mozambique and southeastern Botswana. Regionally it occurs in northern Limpopo province, South Africa (Broadley 1977a; Jacobsen 1989). *EOO*: 15 630 km²; *Distribution*: 13 100 km².

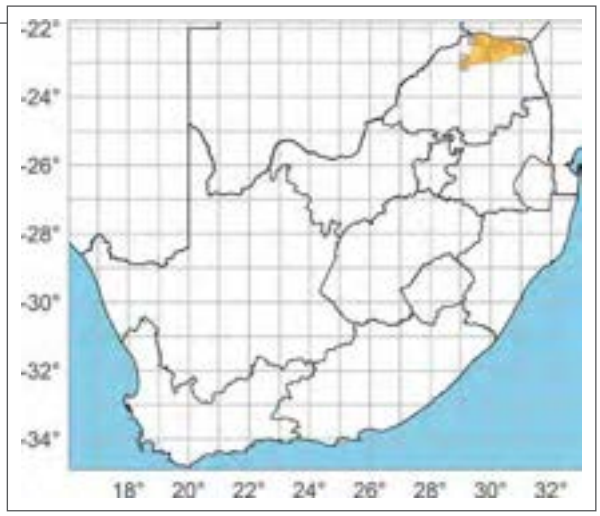
Countries of occurrence: Botswana, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Rupicolous, sheltering in narrow crevices (Barts 2005). Most common between elevations of 550 and 1 500 m a.s.l. (chiefly below 1 000 m a.s.l. in South Africa). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: In spite of the limited geographic range of this species regionally, it occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.



Pachydactylus tigrinus, Tshipise, Limpopo province (© C. Keates).

Pachydactylus tigrinus, Tshikhudini, Limpopo province (© R.I. Stander).

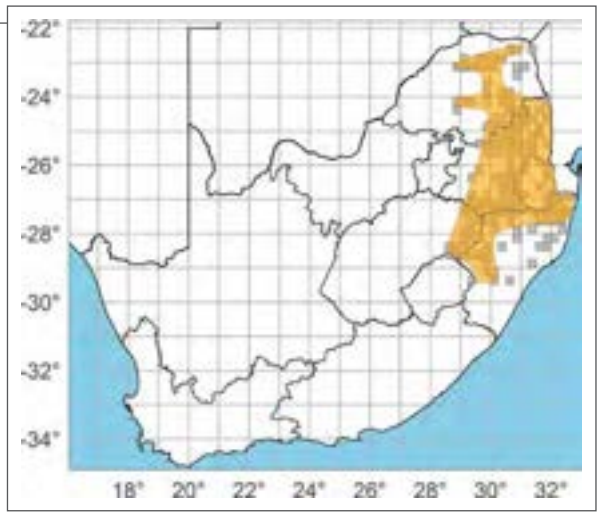
Family **Gekkonidae**

Pachydactylus vansoni FitzSimons, 1933

Van Son's Gecko

LC – Least Concern (Regional)

Assessors: Pietersen, D.W., Weeber, J., Conradie, W., Tolley, K.A., Bates, M.F., Bauer, A.M., Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: A widespread and common species with no major threats. Previously considered near-endemic to the region, it is now known to be more widespread, extending into Mozambique. Given the new Mozambican record, this species assessment is now considered to be Regional.

Taxonomic notes: Formerly a subspecies of *P. capensis*, this species was raised to a full species (Jacobsen 1989). *Pachydactylus vansoni* as currently constructed potentially contains cryptic species, in particular a highveld and a lowveld form (Jacobsen 1989). *Other important names*: none.

Distribution: Distributed from southeastern Zimbabwe into southern Mozambique, Eswatini and northeastern South Africa (Broadley 1977a). There are also isolated records from Vilanculos, Mozambique (ReptileMap: 159767), which could represent either a disjunct subpopulation or suggest that this species is more widespread in Mozambique than previously thought but has not yet been well documented. In South Africa it occurs in the northeast from northern Limpopo province southwards to central KwaZulu-Natal province, and inland to eastern Free State province (Jacobsen 1989; Bates 1996b; Bourquin 2004). *EOO*: 252 000 km²; *Distribution*: 151 000 km².

Countries of occurrence: Eswatini, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Occurs on rocky outcrops, under rocks or in dead aloes. It has an elevational range from sea level to 2 300 m a.s.l. (Broadley 1977a; Jacobsen 1989). *Habitat*: Savanna, Grassland.

Threats: There are no significant threats to this species.

Population trend: Although there is some habitat modification in parts of the range the majority of the distribution is not highly impacted. The widespread distribution and abundance mitigate against the negative effects of local population declines.

Conservation and research recommendations: Taxonomic studies of the highveld and lowveld forms, and the recent records near Vilanculos in Mozambique, are needed.

Pachydactylus vansoni, juvenile colouration, Skukuza, Kruger National Park, Mpumalanga province (© G. Alexander).

Pachydactylus vansoni, Skukuza, Kruger National Park, Mpumalanga province (© G. Alexander).

Family **Gekkonidae**

Pachydactylus visseri Bauer, Lamb & Branch, 2006

Visser's Gecko

LC – Least Concern (Regional)

Assessors: Bates, M.F., Bauer, A.M.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although the South African range is small, this gecko is abundant and occurs in areas that have not undergone significant habitat loss.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs in the Lüderitz and Karasburg districts of Namibia, southwards to the Orange River Valley. Most localities are in the lower Orange River Valley and lower Fish River Valley, but there are scattered localities from the Aurusberg to just south of Aus, Namibia. In South Africa it is restricted to the lower Orange River Valley. *EOO*: 1 560 km²; *Distribution*: 993 km².

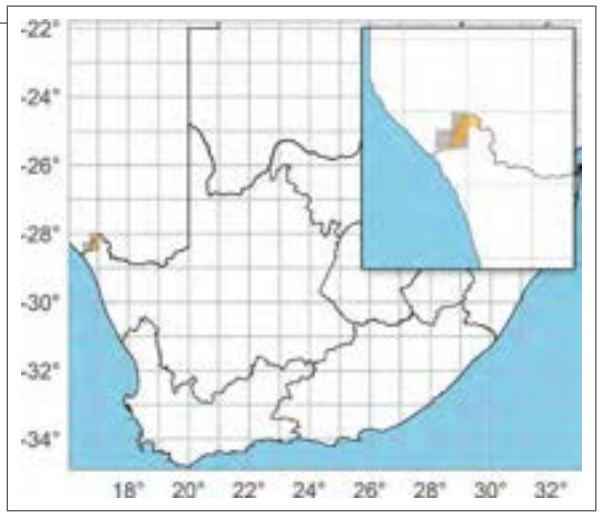
Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in relatively mesic microhabitats in rocky arid areas, such as on boulders and cliffs along large river valleys, and on rocky hills and mountains, from sea level to at least 500 m a.s.l. *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population is stable given that at least half the distribution is within protected areas, and the remainder is not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.



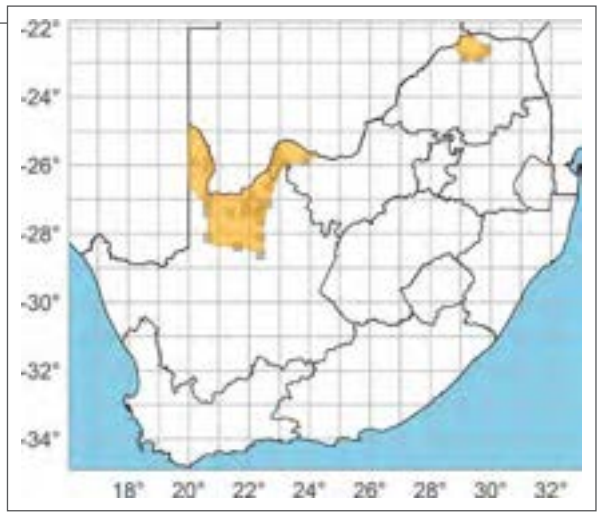
Pachydactylus visseri, Fish River Canyon, Namibia (© W.D. Haacke).

Pachydactylus visseri (© P. van Wyk).

Family **Gekkonidae**

Pachydactylus wahlbergii (Peters, 1869)

Kalahari Ground Gecko



LC – Least Concern (Regional)

Assessor: Bates, M.F.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Colopus wahlbergii wahlbergii* – Least Concern (SARCA).
2014: *Colopus wahlbergii furcifer* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Pachydactylus wahlbergii wahlbergii* (Peters, 1869).
- *Pachydactylus wahlbergii furcifer* (Haacke, 1976)

Assessment rationale: No significant threats throughout its range, much of which falls in semi-arid areas with very little habitat transformation.

Taxonomic notes: Recently transferred from *Colopus* to *Pachydactylus* (Heinicke et al. 2017). There are two subspecies, *P. w. wahlbergii* and *P. w. furcifer* (Haacke 1976d), that differ in colour pattern and morphology, but their taxonomic status has not been investigated in a molecular phylogenetic context. *Other important names*: *Colopus wahlbergii*.

Distribution: Occurs throughout much of the central Kalahari and north of the Soutpansberg in northern Limpopo province, South Africa (Broadley & Rasmussen 1995; Branch 1998), extending into western Zimbabwe, Zambia, Botswana, northern and eastern Namibia (Branch 1998; Broadley & Van Daele 2003; Pietersen et al. 2017) and southeastern Angola (W. Conradie, pers. comm. 2018). *EOO*: 322 000 km²; *Distribution*: 67 600 km².

Pachydactylus wahlbergii furcifer, Upington, Northern Cape province (© M. Burger).

Family **Gekkonidae**

Pachydactylus wahlbergii furcifer, Nossob, Kgalagadi Transfrontier Park, Northern Cape province (© C. & S. Dorse).

Countries of occurrence: Angola, Botswana, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Occurs on sandy substrates of dunes and flat sandy plains that have scattered vegetation (Branch 1998). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: Because this gecko occurs mainly in an arid region that has not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: The status of the two subspecies should be assessed in a molecular phylogenetic framework.

Pachydactylus wahlbergii wahlbergii, north of Vivo, Limpopo province (© R.I. Stander).

Pachydactylus wahlbergii wahlbergii, north of Vivo, Limpopo province (© L. Verburgt).

Family **Gekkonidae**

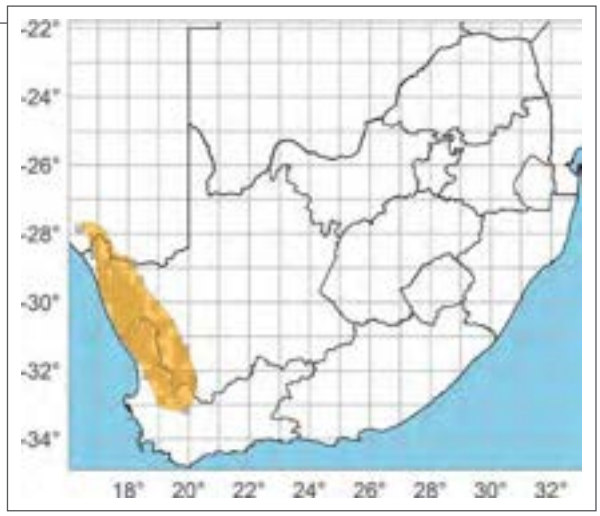
Pachydactylus weberi Roux, 1907

Weber's Gecko

South African near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread, common species with no major threats.

Taxonomic notes: There is some geographic variation in body size, where individuals from inland areas are smaller than those from the western areas (Bauer et al. 2006b), and their status should be reassessed using a phylogenetic approach. *Other important names*: none.

Distribution: Distributed in the arid regions of western South Africa with a single recorded locality from Skerpioenkop in the Lüderitz district, Namibia. In South Africa, it ranges mainly along the western margin, extending about 200 km inland. *EOO*: 89 400 km^2; *Distribution*: 82 000 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Shelters in narrow cracks in rocky habitats such as large outcrops, cliff faces, boulder clusters and small rock piles. It ranges from sea level to at least 1 500 m a.s.l. (Bauer et al. 2006b). *Habitat*: Desert, Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: Confirmation is needed for the extent of the distribution in Namibia.

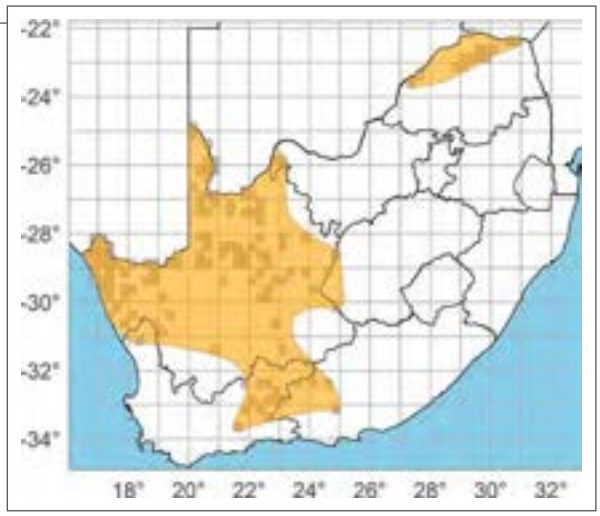
Pachydactylus weberi, Springbok, Northern Cape province (© L. Kemp).

Pachydactylus weberi, Steinkopf, Northern Cape province (© C. Keates).

Family **Gekkonidae**

Ptenopus garrulus (Smith, 1849)

Common Barking Gecko



LC – Least Concern (Regional)

Assessor: Bates, M.F.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Ptenopus garrulus garrulus* – Least Concern (SARCA).
2014: *Ptenopus garrulus maculatus* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Ptenopus garrulus garrulus* (Smith, 1849).
- *Ptenopus garrulus maculatus* Gray, 1866.

Assessment rationale: Widespread and locally abundant with no obvious threats throughout its range, much of which is in semi-arid to arid areas with relatively little habitat transformation.

Taxonomic notes: Trinomials have been used since FitzSimons (1935) treated *P. maculatus* Gray, 1866 as a subspecies of *P. garrulus* (Brain 1962; Haacke 1975). *Other important names*: *Ptenopus maculatus*; *Ptenopus garrulus garrulus*; *Ptenopus garrulus maculatus*.

Distribution: Occurs across most of the arid western and central regions of southern Africa. In South Africa, it occurs across most of the arid central and north-western regions. *EOO*: 1 009 00 km^2; *Distribution*: 398 000 km^2.

Ptenopus garrulus maculatus, Aggeneys, Northern Cape province (© L. Kemp).

Ptenopus garrulus garrulus, Weltevrede Guest Farm, Solitaire region, Namibia (© L. Verburgt).

Family **Gekkonidae**

Ptenopus garrulus maculatus, Beaufort West, Western Cape province (© C.R. Hundermark).

Ptenopus garrulus maculatus, Beaufort West, Western Cape province (© L. Verburgt).

Countries of occurrence: Botswana, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Digs complex, branching burrows in sandy soils, including dune sands, in Savanna and karroid habitats. Males call at the burrow entrance, mainly at sunset (Hibbitts et al. 2007). *Habitat*: Desert, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this gecko occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: No recommendations.

Ptenopus garrulus garrulus, Tshipise, Limpopo province (© C. Keates).

Family **Gekkonidae**

Ramigekko swartbergensis (Haacke, 1996)

Swartberg Leaf-toed Gecko

South African endemic

LC – Least Concern (Global)

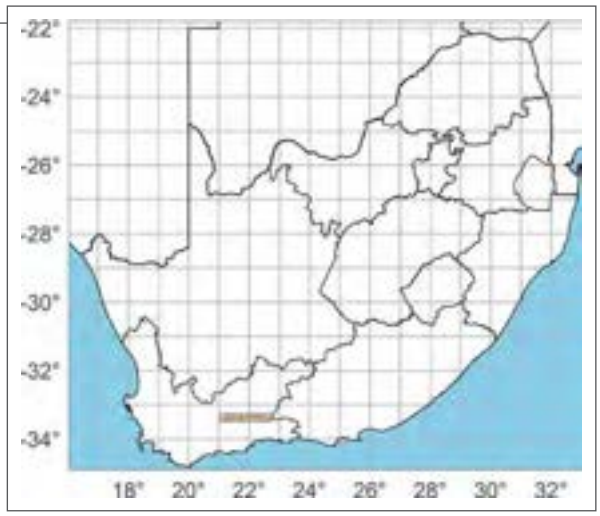
Assessors: Tolley, K.A., Bates, M.F.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).

Assessment rationale: Although this species has a small distribution, the entire range is within a pristine and well-managed provincial protected area (Swartberg Nature Reserve), where it occurs at high elevation in rugged and largely inaccessible terrain.

Taxonomic notes: The generic placement of this species has changed, initially being placed in *Phyllodactylus* (Haacke 1996) and thereafter transferred to *Afrogecko* (Bauer et al. 1997). Phylogenetic analysis has resolved this uncertainty, placing this species in a monotypic genus, *Ramigekko* (Heinicke et al. 2014). There are no further taxonomic issues.

Ramigekko swartbergensis, Swartberg Pass, Western Cape province (© L. Kemp).



Other important names: *Phyllodactylus swartbergensis*; *Afrogecko swartbergensis*.

Distribution: Restricted to high-elevation areas of the Groot and Klein Swartberge in the Western Cape province, South Africa. There are only two records from the eastern extent of the Swartberg, and suitable habitat occurs there so it is therefore inferred to be part of the range. *EOO*: 1 620 km^2; *Distribution*: 815 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Shelters in rock cracks and under exfoliating rock flakes, usually on large sandstone outcrops in montane Fynbos at elevations of 1 300–2 100 m a.s.l. (Branch & Bauer 1996). *Habitat*: Shrubland.

Threats: There are no threats to this species.

Population trend: It is possible that the species has a patchy distribution or that abundances are naturally low, given that there are few records, but this could also be a result of the difficult terrain, which hinders the ease of comprehensive surveys. Because the entire geographic range is in a largely inaccessible protected area, the population size is assumed to be stable.

Conservation and research recommendations: Better distribution data in the eastern Swartberg would assist to refine estimates of distribution size and EOO for this species.

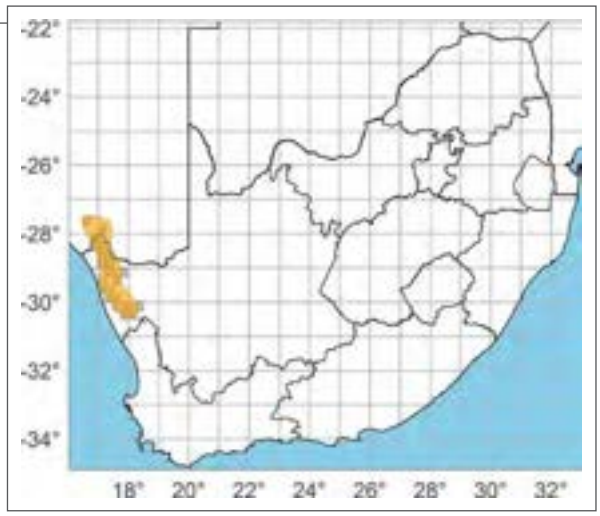
Rhoptropella ocellata (Boulenger, 1885)

Namaqua Day Gecko

South African near-endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment) as *Phelsuma ocellata*.
2017: Least Concern (Global IUCN assessment) as *Phelsuma ocellata*.
2014: Least Concern (SARCA) as *Phelsuma ocellata*.
1996: Lower Risk/Near Threatened (Global IUCN assessment) as *Phelsuma ocellata*.
1994: Rare (Global IUCN assessment) as *Phelsuma ocellata*.

Assessment rationale: A widespread species that occurs in areas with little habitat transformation. There are no significant threats.

Taxonomic notes: The generic placement of this species has long been in question, having been placed in *Rhoptropus* (Boulenger 1885; Branch 1998), *Phelsuma* (Roux 1907; Schmidt 1933) and a monotypic genus *Rhoptropella* (Hewitt 1937a). Evidence from phylogenetic studies have not yet adequately resolved the genus level status (Austin et al. 2004; Sound et al. 2006) although it is currently assigned to *Rhoptropella* (see Austin et al. 2004). *Other important names*: *Rhoptropus ocellatus*; *Phelsuma ocellata*.

Distribution: Distributed in northwestern South Africa in the arid Namaqualand region, extending approximately 50 km into Namibia having been recorded at Süd Witpütz (Bauer & Branch 2003) and Ai-Ais (Griffin 2003). *EOO*: 24 500 km^2; *Distribution*: 18 800 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: This rupicolous species shelters in rocky outcrops from near sea level to high mountains in areas that receive moisture from coastal fog. *Habitat*: Shrubland, Desert.

Threats: There are no significant threats to this species.

Population trend: Because this gecko occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: A comprehensive phylogenetic study to better resolve the generic placement of this species is needed, given that the existing phylogenies included few individuals of the potentially related genera. Confirmation is needed for the extent of the distribution in Namibia.

Rhoptropella ocellata, near Port Nolloth, Northern Cape province (© L. Kemp).

Family **Amphisbaenidae**

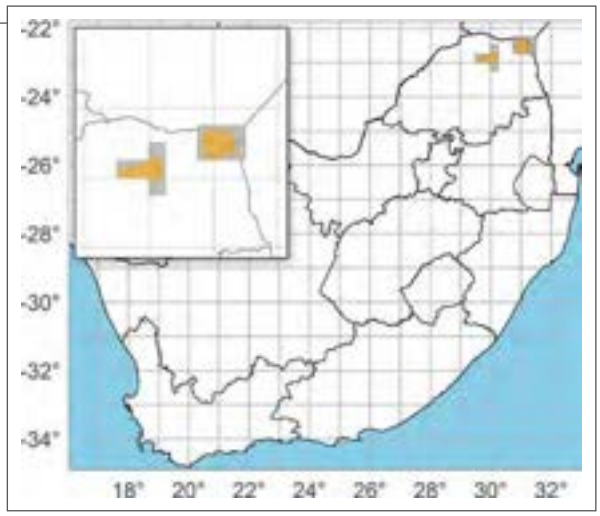
Chirindia langi FitzSimons, 1939

Lang's Worm Lizard

South African endemic

LC – Least Concern (Global)

Assessor: Measey, J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Chirindia langi langi* – Least Concern (SARCA).
2014: *Chirindia langi occidentalis* – Vulnerable (SARCA).

Subspecies included under this assessment:
- *Chirindia langi langi* FitzSimons, 1939.
- *Chirindia langi occidentalis* Jacobsen, 1984.

Assessment rationale: There is some loss of habitat quality and extent locally in the western part of the range, but this is not considered a significant threat to the species.

Taxonomic notes: The taxonomic status of the *C. langi* species complex should be reassessed, preferably by using a combination of morphological and phylogenetic analyses, to determine whether the subspecies *C. l. occidentalis* is a valid taxon. *Other important names*: none.

Distribution: This species occurs as two disjunct subpopulations that correspond to the two subspecies. It occurs in the Soutpansberg, northern Limpopo province (South Africa), and in northern Kruger National Park (South Africa) and is likely to extend into adjacent Mozambique (Jacobsen 1989; Branch 1998) but has not yet been recorded from there. The distribution of this species is not fully known and it may extend further into Mozambique and possibly into

Chirindia langi occidentalis, Soutpansberg, Limpopo province (© M. Petford).

southeastern Zimbabwe than current records suggest. *EOO*: 7 540 km²; *Distribution*: 3 610 km².

Country of occurrence: South Africa.

Habitat and ecology: A fossorial species, occurring under rocks, in burrows or in rotting logs, in sandy Kalahari soils with Mixed Bushveld and clay substrates of mopane (*Colophospermum mopane*) Woodland between 230 and 1 400 m a.s.l. elevation (Jacobsen 1989). It is unknown to what extent they are able to disperse, although vagility within soil is expected to be low. The two subspecies appear to occur at different elevations with *C. l. occidentalis* at higher elevations (800–1 400 m a.s.l.) and *C. l. langi* at lower elevations (230–700 m a.s.l.). *Habitat*: Savanna.

Threats: Habitat transformation caused by agricultural activities could be a threat in parts of the range (Jacobsen 1989).

Population trend: This species occurs at low densities even where habitat is appropriate. Despite this, the population size is assumed to be stable because this is a fairly widespread species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: An improved estimate of the distribution is needed, as well as an assessment of the potential impacts of agricultural activities. The taxonomy of the subspecies should be assessed in a phylogenetic framework.

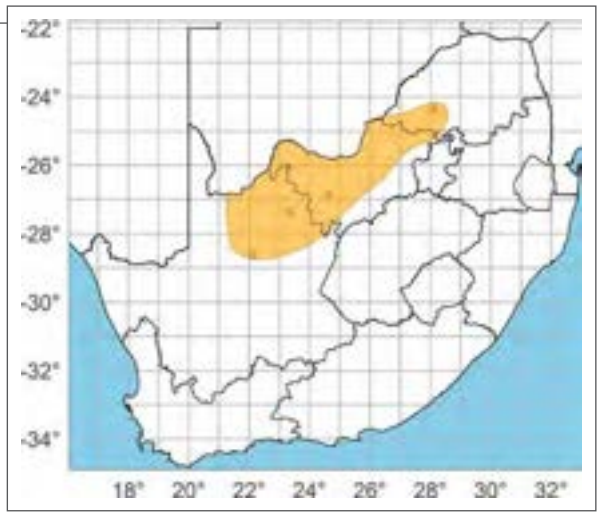
Family **Amphisbaenidae**

Dalophia pistillum (Boettger, 1895)

Blunt-tailed Worm Lizard

LC – Least Concern (Regional)

Assessor: Measey, J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common throughout its global range. Although rarely recorded from South Africa, it is not considered to be under any significant threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Widely distributed in southern Africa and into Angola (Broadley et al. 1976; Branch 1998). There are very few records from South Africa, making an estimate of distribution difficult. It most likely occurs from Limpopo province, westward into the Northern Cape province (Bates et al. 2010). *EOO*: 191 000 km²; *Distribution*: 157 000 km².

Countries of occurrence: Angola, Botswana, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Fossorial, usually found within 20 cm of the soil surface, and known to take refuge in grass roots at depths of 10 cm (Jacobsen 1989). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: In spite of there being few records from South Africa, the species is probably widespread and occurs largely in areas not significantly impacted by habitat loss, thus the population is unlikely to have declined significantly. The lack of records is most likely due to the fossorial nature of this species, making these lizards difficult to record.

Conservation and research recommendations: No recommendations.

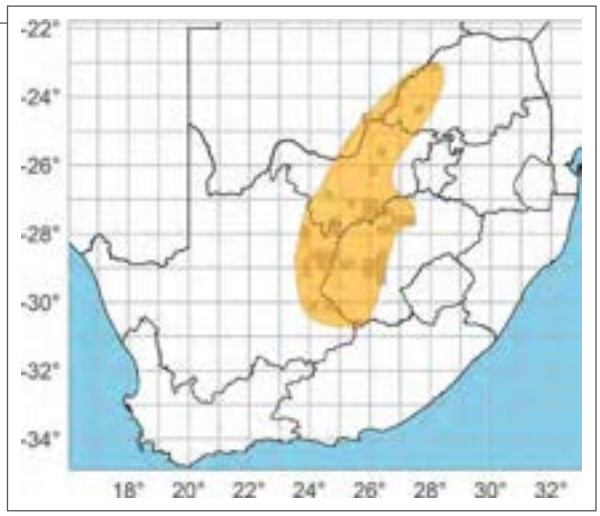
Dalophia pistillum, Maun, Botswana (© G. Reed).

Dalophia pistillum, Maun, Botswana (© G. Reed).

Family **Amphisbaenidae**

Monopeltis capensis Smith, 1848

South African Spade-snouted Worm Lizard



Regional near-endemic

LC – Least Concern (Global)

Assessor: Measey, J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no substantial threats.

Taxonomic notes: The three forms of *M. c. capensis* and the subspecies *M. c. rhodesianus* were elevated to full species based on morphology (Broadley 1997), but this has not yet been examined in a phylogenetic framework (see Measey & Tolley 2013). *Other important names*: none.

Distribution: Occurs in north-central South Africa and marginally in southeastern Botswana (Broadley 1997). The distribution appears to largely coincide with Highveld Grassland and Kalahari bushveld. *EOO*: 231 300 km²; *Distribution*: 203 150 km².

Countries of occurrence: Botswana, South Africa.

Habitat and ecology: Fossorial, occurring in soils at depths up to 20 cm (Broadley et al. 1976) and has been recorded under large rocks (e.g., Conradie et al. 2011) and on the surface after heavy rains. *Habitat*: Grassland, Savanna, Shrubland.

Threats: This fossorial species may be impacted by intensive agriculture and other land uses that disturb the soil, but this is not considered a significant threat at present.

Population trend: Although there is some habitat loss across the range, the widespread range and abundance of this lizard mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Monopeltis capensis, Rooipoort, Northern Cape province (© K.A. Tolley).

Family **Amphisbaenidae**

Monopeltis decosteri Boulenger, 1910

De Coster's Spade-snouted Worm Lizard

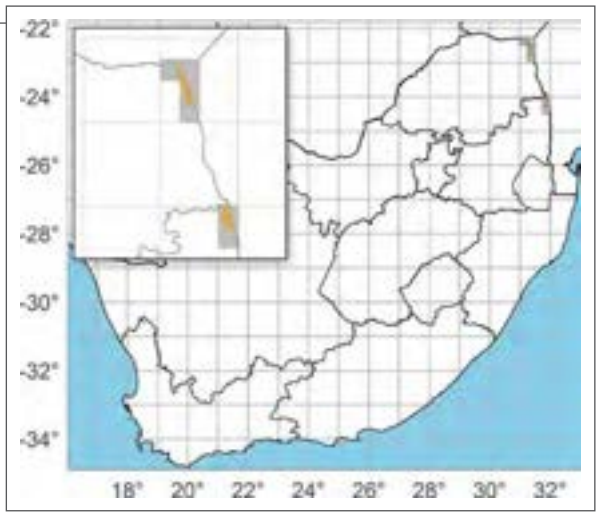
LC – Least Concern (Regional)

Assessor: Measey, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Within South Africa, this species has a moderate-sized distribution and occurs entirely within a large, protected area, with no significant threats.

Taxonomic notes: *Monopeltis decosteri* falls within the larger *M. capensis* species complex (Broadley et al. 1976) and was considered a synonym of *M. capensis* until its reinstatement as a full species (Broadley 1997). A phylogenetic analysis of the relationships within this species complex has not yet been carried out (see Measey and Tolley 2013). *Other important names*: *Monopeltis capensis capensis* ('Group C').



Distribution: Occurs in northeastern southern Africa. Widespread on the Mozambique plain, entering southeastern Zimbabwe. In South Africa, it occurs in sandy intrusions in the extreme northeastern and eastern Kruger National Park in Limpopo and Mpumalanga provinces (Broadley 1997). *EOO*: 2 720 km^2; *Distribution*: 716 km^2.

Countries of occurrence: Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Fossorial, occurring in sandy soils (Branch 1998). *Habitat*: Savanna.

Threats: There are no significant threats.

Population trend: The population size is assumed to be stable because it occurs entirely within a protected area that has not been impacted by habitat transformation.

Conservation and research recommendations: Additional occurrence records would allow for a better estimate of distribution, particularly outside of South Africa. A phylogenetic analysis that includes this and other species in the genus would allow for an improved assessment of the current taxonomy in the group.

Monopeltis decosteri, Maputo Bay, Mozambique (© M. Burger).

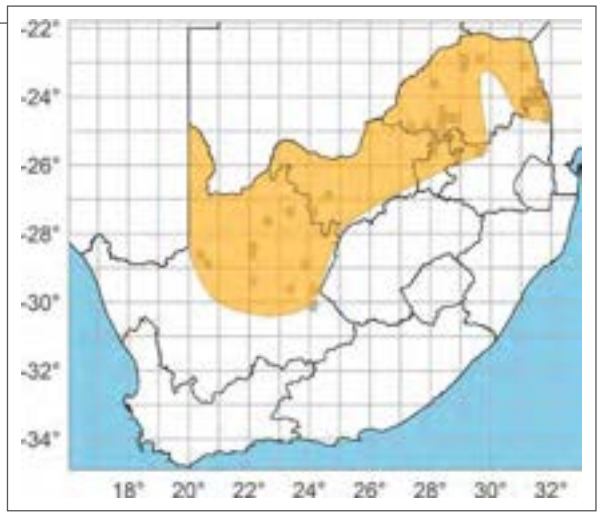
Family **Amphisbaenidae**

Monopeltis infuscata Broadley, 1997

Dusky Spade-snouted Worm Lizard

LC – Least Concern (Regional)

Assessor: Measey, J.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This is a widespread species with no significant threats.

Taxonomic notes: *Monopeltis infuscata* falls within the larger *M. capensis* species complex (Broadley et al. 1976). Although other species of *Monopeltis* have been included in a phylogenetic analysis (Measey & Tolley 2013), *M. infuscata* has not yet been included so its phylogenetic placement is not certain. *Other important names*: *Monopeltis capensis capensis* ('Group B').

Distribution: Widespread in southern Africa, ranging from southern Angola through Namibia and Botswana to South Africa and extreme southern Zimbabwe (Broadley 1997). In South Africa, it occurs in the northeast, extending westward to the arid Northern Cape province (Broadley 1997). *EOO*: 670 000 km^2; *Distribution*: 412 000 km^2.

Countries of occurrence: Angola, Botswana, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Fossorial, although individuals are sometimes observed on the surface following heavy rains. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread species and much of the distribution is in areas that are not heavily impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Monopeltis infuscata, Hoedspruit, Limpopo province (© D.W. Pietersen).

Monopeltis infuscata, Groblershoop, Northern Cape province (© D.W. Pietersen).

Family **Amphisbaenidae**

Monopeltis leonhardi Werner, 1910

Kalahari Worm Lizard

LC – Least Concern (Regional)

Assessors: Alexander, G.J., Tolley, K.A., Measey, J.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).

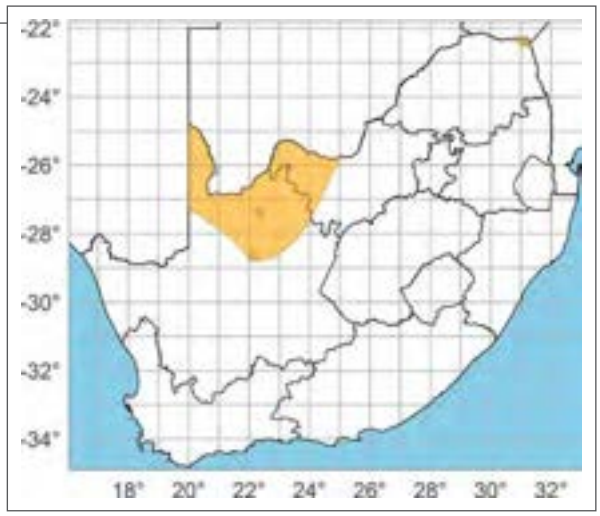
Assessment rationale: Presumably widespread with no major threats.

Taxonomic notes: No issues. *Other important names*: none.

Distribution: This species has been recorded from eastern Namibia, extending across Botswana, into southeastern Zimbabwe, and Limpopo and Northern Cape provinces, South Africa. *EOO*: 354 000 km²; *Distribution*: 109 000 km².

Countries of occurrence: Botswana, Namibia, South Africa, Zimbabwe.

Habitat and ecology: This is a fossorial species that occurs in sandy substrates (Broadley et al. 1976). *Habitat*: Savanna.



Threats: There are no significant threats.

Population trend: There are only a few records for this species, but it is assumed to be widespread in an area that is not significantly impacted by habitat transformation.

Conservation and research recommendations: Additional distribution records are needed to assess the extent of the distribution, particularly for South Africa.

Monopeltis leonhardi, Groblershoop, Northern Cape province (© D.W. Pietersen).

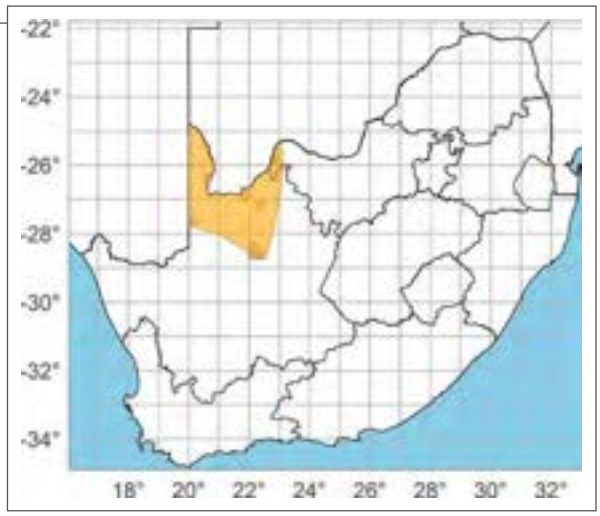
Family **Amphisbaenidae**

Monopeltis mauricei Parker, 1935

Maurice's Spade-snouted Worm Lizard

LC – Least Concern (Regional)

Assessor: Measey, J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread across areas that have largely intact habitat.

Taxonomic notes: *Monopeltis mauricei* has been treated as a subspecies of *M. sphenorhynchus* (Broadley et al. 1976; Branch 1998) but was elevated to specific status based on morphology (Broadley 2001a). These two species were thought to be allopatric, however a new record shows that *M. sphenorhynchus* occurs deep within the range of *M. mauricei* (Bates et al. 2010), and there is some overlap between the number of body annuli between these two species. The specific status of these species should be re-evaluated within a phylogenetic framework. *Other important names*: *Monopeltis sphenorhynchus mauricei*.

Distribution: Occurs in the Kalahari Desert, extending into southwestern Zambia and northwestern Zimbabwe. In South Africa, it occurs in areas north of the Orange River (Broadley et al. 1976; Bates et al. 2010). *EOO*: 108 000 km^2; *Distribution*: 67 400 km^2.

Countries of occurrence: Botswana, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Fossorial, usually occurring in sparsely vegetated sands. Individuals are often found on the surface following heavy rains. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not greatly impacted by habitat transformation.

Conservation and research recommendations: The taxonomic relationship between this species and *M. sphenorhynchus* should be evaluated within a phylogenetic framework.

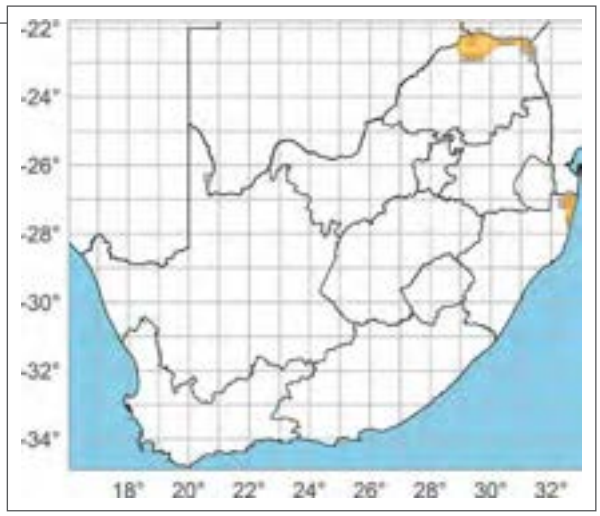
Monopeltis mauricei, Groblershoop, Northern Cape province (© D.W. Pietersen).

Monopeltis mauricei, Grootdrink, Northern Cape province (© D.W. Pietersen).

Family **Amphisbaenidae**

Monopeltis sphenorhynchus Peters, 1879

Slender Spade-snouted Worm Lizard



LC – Least Concern (Regional)

Assessor: Measey, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Much of this species' range falls within protected areas and it is relatively common where it occurs, with no significant threats.

Taxonomic notes: *Monopeltis mauricei* was formerly a subspecies of *M. sphenorhynchus*, with *M. mauricei* elevated to a full species based on distinct morphological characters and an apparently allopatric distribution (Broadley et al. 1976; Broadley 2001a). A phylogenetic study (Measey & Tolley 2013) shows that this species falls within the *M. capensis* group, but with some uncertainty over its relationship with *M. capensis*. Given that a new record shows that *M. sphenorhynchus* occurs deep within the range of *M. mauricei* (Bates et al. 2010), and there is some overlap between the number of body annuli between the species, the specific status of these species should be re-evaluated within a phylogenetic framework. *Other important names*: none.

Monopeltis sphenorhynchus, Masisi, Limpopo province (© R.I. Stander).

Family **Amphisbaenidae**

Monopeltis sphenorhynchus, Venetia Limpopo Nature Reserve, Limpopo province (© M. Burger).

Distribution: Widespread from northeastern South Africa and southern coastal Mozambique, across the Mozambique plains, into southeastern Botswana (Broadley 2001a; Pietersen et al. 2013). The range enters South Africa in two areas, northern KwaZulu-Natal province and Limpopo province, north of the Soutpansberg (Branch 1998). A record from the Kgalagadi Transfrontier Park in the Northern Cape province also appears to be referable to this species (Bates et al. 2010), suggesting it could be more widespread in South Africa. *EOO*: 445 000 km^2; *Distribution*: 14 000 km^2.

Countries of occurrence: Botswana, Mozambique, South Africa.

Habitat and ecology: Fossorial, usually occurring in deep sand from near sea level to at least 800 m a.s.l. (Jacobsen 1989). *Habitat*: Grassland, Forest, Savanna.

Threats: There are no substantial threats to this species.

Population trend: In spite of the small geographic range of this species in South Africa, it occurs in areas with relatively little habitat transformation, including in protected areas. Population size is thus assumed to be stable.

Conservation and research recommendations: The taxonomic status of the population in the Kgalagadi Transfrontier Park in the Northern Cape province of South Africa should be investigated, as should the identity of the intervening populations between this record and the main population. The validity of *M. sphenorhynchus* and *M. mauricei* should be evaluated in a phylogenetic framework.

Family **Amphisbaenidae**

Zygaspis arenicola Broadley & Broadley, 1997

Sand-dwelling Dwarf Worm Lizard

LC – Least Concern (Regional)

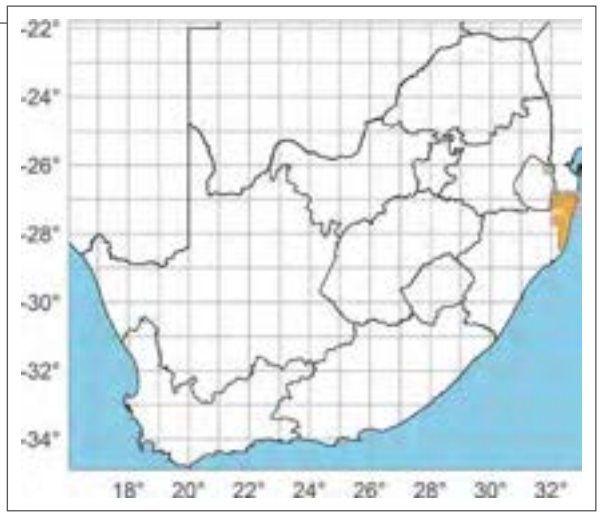
Assessors: Pietersen, D.W., Conradie, W., Tolley, K.A., Weeber, J., Alexander, G.J.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).

Assessment rationale: Although there may be some decline in extent and quality of habitat within the distribution, this species has a large range and the threats are not considered significant.

Taxonomic notes: The two subspecies, *Z. v. vandami* and *Z. v. arenicola* (Broadley & Broadley 1997) were referred to as separate species by Gans (2005). On the basis of differences in geographic range and ecology, as well as the morphological differences, Bates (2018) elevated *Z. arenicola* to a full species, and by this action, *Z. vandami* is now considered a monotypic species. A phylogenetic analysis of their relationships has yet to be carried out. *Other important names*: *Zygaspis vandami arenicola*.

Distribution: Occurs in the northeastern lowland parts of South Africa and eastern Eswatini, into adjacent southern Mozambique and southeastern Zimbabwe. *EOO*: 16 400 km²; *Distribution*: 8 550 km².



Zygaspis arenicola, St Lucia, KwaZulu-Natal province (© G.K. Nicolau).

Countries of occurrence: Eswatini, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Fossorial, occurring in the top 25 cm of soil coinciding with deep leaf litter and high invertebrate densities (Measey et al. 2009; Bates 2018), and has been recorded in high densities in sand forest habitat (Pooley et al. 1973; Measey et al. 2009). *Habitat*: Savanna, Forest.

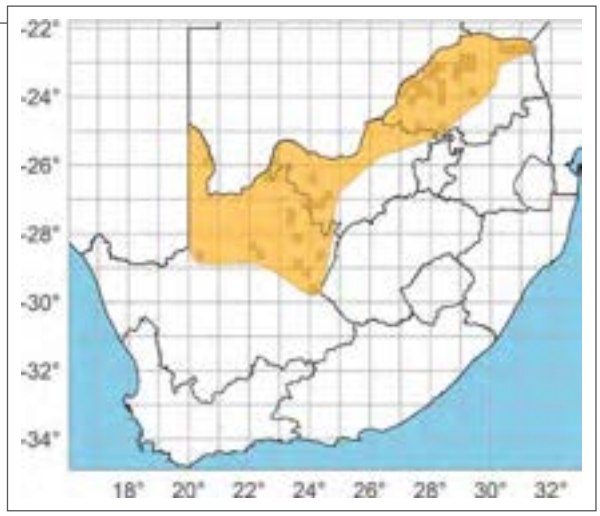
Threats: There has been a decline in habitat quality and extent in the southern part of the range, which might have some impact on this species.

Population trend: The extent of habitat transformation is small in relation to the large range of this species and part of the distribution is within a large, protected area. It is thus assumed that any local population declines do not pose a threat to this lizard.

Conservation and research recommendations: Improved sampling and a phylogenetic analysis that also includes other species in the genus would allow for an improved assessment of the current taxonomy in the group. Samples of *Z. vandami sensu lato* that were included in phylogenetic analyses did not refer to the subspecies involved (Measey & Tolley 2013; Broadley & Measey 2016) and based on distribution, these samples are assignable to *Z. arenicola*.

Zygaspis quadrifrons (Peters, 1862)

Kalahari Dwarf Worm Lizard



LC – Least Concern (Regional)

Assessor: Measey, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, not considered to be subject to any significant threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: This is the most widely distributed *Zygaspis* species, occurring from northern South Africa to southern Democratic Republic of the Congo (Broadley & Broadley 1997). In South Africa, it occurs in Limpopo province, the western parts of North West province and the northern half of the Northern Cape province. *EOO*: 525 000 km²; *Distribution*: 276 000 km².

Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Inhabits deep Kalahari sands as well as loamy or clayey soils from 250 to 1 200 m a.s.l. (Jacobsen 1989). Usually occurs under stones or rotting logs, or underground (Jacobsen 1989). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a very widespread species, and large parts of the range are in areas that are not heavily impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Zygaspis quadrifrons, Pafuri, Limpopo province (© R.E. Stander).

Zygaspis quadrifrons, Witsand Nature Reserve, Northern Cape province (© L. Kemp).

Family **Amphisbaenidae**

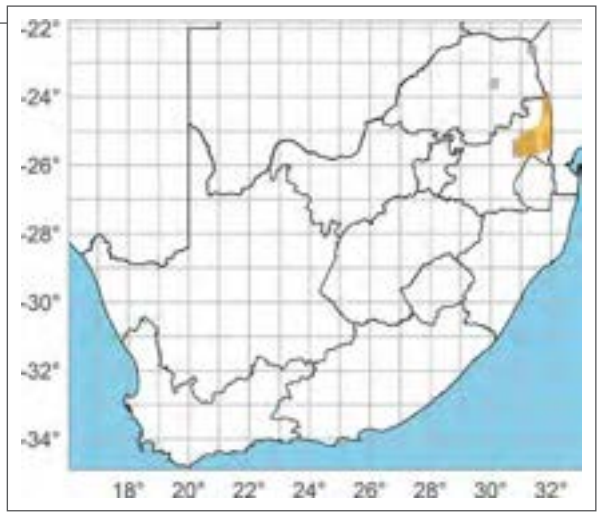
Zygaspis vandami (FitzSimons, 1930)

Van Dam's Dwarf Worm Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Pietersen, D.W., Alexander, G.J., Tolley, K.A., Conradie, W., Weeber, J., Measey, J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Assessment rationale: Although there is some decline in extent and quality of habitat, this is within a minor part of the distribution and this threat is not considered significant.

Taxonomic notes: The two subspecies, *Z. v. vandami* and *Z. v. arenicola* (Broadley & Broadley 1997) were referred to as separate species by Gans (2005). On the basis of differences in geographic range and ecology, as well as the morphological differences, Bates (2018) elevated *Z. arenicola* to a full species, and by this action, *Z. vandami* is now considered a monotypic species. Samples of '*Z. vandami*' included in phylogenetic analyses did not refer to subspecies (Measey & Tolley 2013; Broadley & Measey 2016) and based on distribution, these are assignable to '*Z. v. arenicola*'. Therefore, analyses have not yet included both species. *Other important names*: *Zygaspis violacea*.

Distribution: Occurs in the lowlands and escarpment of northeastern South Africa (Jacobsen 1989; Broadley & Broadley 1997), with a record in the northern Kruger National Park that might be linked along the southern slopes of the Soutpansberg (Broadley & Broadley 1997), through Mozambique, or along the Lebombo Mountains. It might also extend marginally into Eswatini. There is another outlying record in Limpopo province to the northwest of the remainder

Zygaspis vandami, Mbombela, Mpumalanga province (© D.W. Pietersen).

Zygaspis vandami, Mbombela, Mpumalanga province (© M. Petford).

of the range (Jacobsen 1989; Broadley & Broadley 1997). Both these outlying records suggest this species might be more widespread throughout Limpopo province and possibly into Mozambique. These records have been included in the EOO estimate. *EOO*: 48 800 km^2; *Distribution*: 11 600 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This fossorial species is usually associated with rocky situations at elevations of 150–1 000 m a.s.l., where it shelters under stones on sandy or humus-rich soils (Jacobsen 1989; Broadley & Broadley 1997). *Habitat*: Savanna.

Threats: There has been some land transformation for agriculture, silviculture and housing developments, but these threats are not considered significant at present.

Population trend: Although some of the geographic range has been transformed, this species occurs in many areas that are not significantly impacted by habitat loss. Thus, the population size is suspected to be stable.

Conservation and research recommendations: Improved sampling and a phylogenetic analysis that includes other species in the genus would allow for a better assessment of the current taxonomy of the former subspecies. Samples of *Z. vandami sensu lato* that were included in phylogenetic analyses did not refer to the subspecies involved (Measey & Tolley 2013; Broadley & Measey 2016) and based on distribution, these samples are assignable to *Z. arenicola*. Confirmation of this species' range in Limpopo province and whether it might also occur in Eswatini and Mozambique is needed.

Family **Lacertidae**

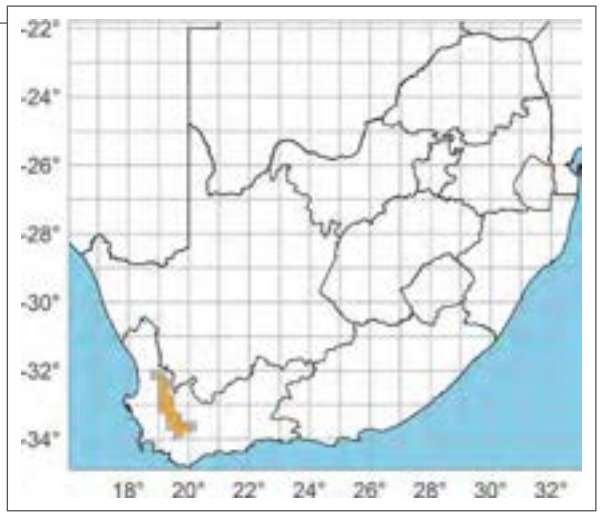
Australolacerta australis (Hewitt, 1926)

Southern Rock Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Cunningham, M.J., Tolley, K.A., Turner, A.A.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).
1996: Lower Risk/Least Concern (Global IUCN assessment).
1994: Rare as *Lacerta australis* (Global IUCN assessment).

Assessment rationale: Has a relatively small range but occurs mostly in high-elevation areas where there is little anthropogenic threat to the habitat.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Distributed in the southeastern extent of South Africa, across the Cape Fold Mountain range from the Cederberg, southeast to the Langeberg. *EOO*: 8 680 km^2; *Distribution*: 6 480 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs at the higher elevations of mountainous regions in the Fynbos biome. *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The species is not considered to be in decline because most of the distribution is within areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Australolacerta australis, Heuningvlei, Cederberg Wilderness Area, Western Cape province (© F.N. Mouton).

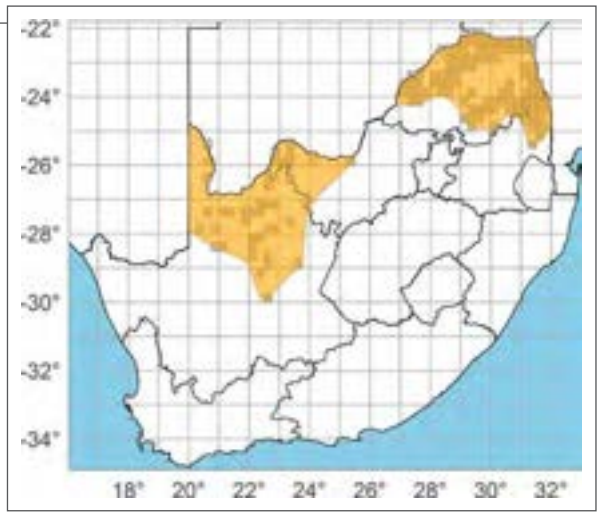
Family **Lacertidae**

Heliobolus lugubris (Smith, 1838)

Bushveld Lizard

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread with no major threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Widely distributed from southern Angola through Namibia and Botswana to western and southern Zimbabwe, southern Mozambique and South Africa (Branch 1998). The species enters South Africa from the north, in the mesic northeast and the arid northern Kalahari and Karoo regions, with these areas of the distribution connected through Botswana. *EOO*: 612 000 km²; *Distribution*: 246 000 km².

Countries of occurrence: Angola, Botswana, Mozambique, Namibia, South Africa, Zimbabwe.

Habitat and ecology: A common diurnal, terrestrial species that forages between grass tussocks and other vegetation on sandy substrates. Juveniles have aposematic colouration and mimic the foul-tasting and chemically defensive *oogpister* ground beetle (genus *Anthia*). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not heavily impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Heliobolus lugubris, juvenile colouration, Lephalale, Limpopo province (© L. Verburgt).

Heliobolus lugubris, Tshipise, Limpopo province (© C. Keates).

Heliobolus lugubris, Hoedspruit, Limpopo province (© L. Kemp).

Family **Lacertidae**

Ichnotropis capensis (Smith, 1838)

Cape Rough-scaled Lizard

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widely distributed and occurring in several large, protected areas. There are no known substantial threats to the species or its habitat.

Taxonomic notes: While previously thought to be in isolated subpopulations in South Africa (Turner 2014a), genetic data (K.A. Tolley, unpubl. data 2020) and new records from Mozambique (Pietersen et al. 2013) suggest the South African subpopulations are connected through Mozambique, Zimbabwe and Botswana. *Other important names*: none.

Distribution: Widely distributed in southern Africa, from Angola south to South Africa and east to Mozambique. In South Africa it occurs in two areas, northern South Africa (mostly Limpopo province) and northern KwaZulu-Natal province (FitzSimons 1943; Branch 1998), and these areas are probably linked in the north. *EOO*: 151 000 km^2; *Distribution*: 59 700 km^2.

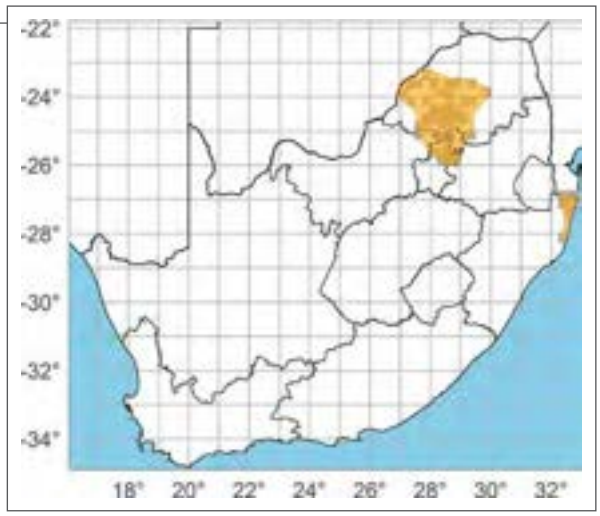
Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Occurs on sandy or loose soil in areas with sparse vegetation. *Habitat*: Savanna.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not heavily impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

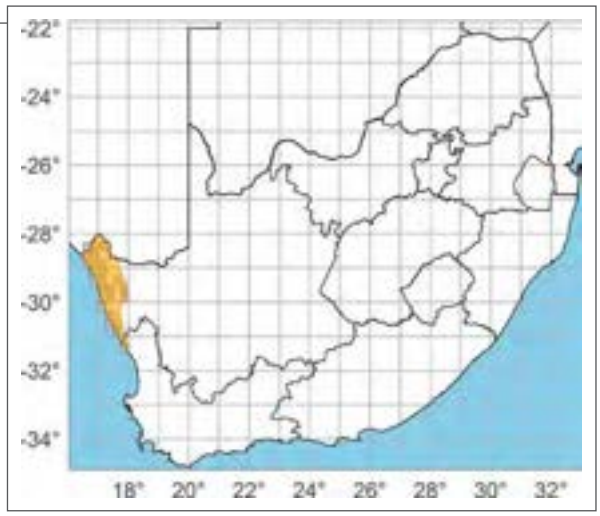


Ichnotropis capensis, Xai-Xai, Mozambique (© W. Conradie).

Ichnotropis capensis, juvenile colouration, Lephalale, Limpopo province (© L. Verburgt).

Meroles ctenodactylus (Smith, 1838)

Giant Desert Lizard



LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a moderate-sized distribution, with no known substantial threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs from Sossusvlei in southern Namibia, southwards along the west coast to the northern portions of the Western Cape province of South Africa (Branch 1998; Branch 2013). In South Africa, its range along the west coast extends inland ± 80 km, roughly following the Succulent Karoo biome. *EOO*: 26 500 km²; *Distribution*: 22 100 km².

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Inhabits sparsely vegetated areas with loose sand (Branch 1998) or well-vegetated dune slacks and dune hummocks (Branch 2013). *Habitat*: Shrubland, Desert, Coastal sand dunes.

Threats: Some parts of the distribution may be affected by coastal strip mining, but this occurs within a small part of the range.

Population trend: Because this lizard occurs mainly in arid regions that have not been extensively impacted by habitat transformation, and because it appears abundant where it occurs, the population size is not thought to have declined although the effects of coastal strip mining on this species have not been quantified.

Conservation and research recommendations: No recommendations.

Meroles ctenodactylus, Koingnaas, Northern Cape province (© L. Kemp).

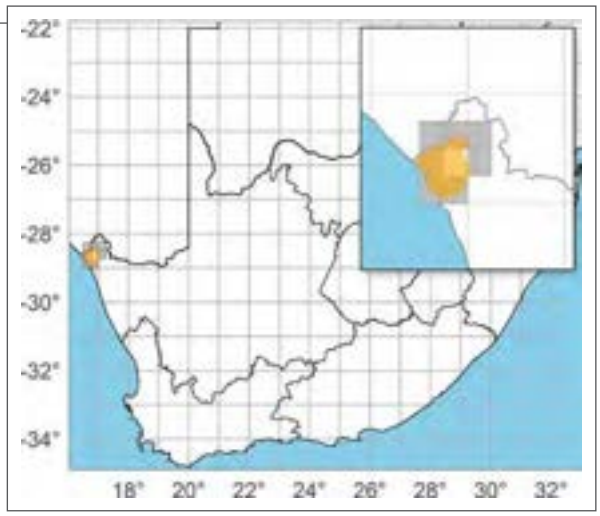
Family **Lacertidae**

Meroles cuneirostris (Strauch, 1867)

Wedge-snouted Desert Lizard

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a small range in South Africa but occurs in areas that are not significantly impacted by habitat loss, including the Richtersveld National Park.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs throughout most of the southern Namib Desert of Namibia south of Walvis Bay, peripherally entering South Africa in the sandy region south of the Orange River (Branch 1998). *EOO*: 2 440 km^2; *Distribution*: 2 210 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs on sparsely vegetated desert sands and coastal dunes, especially those with loose sand (Branch 1998). *Habitat*: Shrubland, Desert, Coastal sand dunes.

Threats: Although there are no substantial threats to this species, there is some habitat transformation due to agriculture, and coastal strip mining is a potential threat in part of the range. However, this constitutes only about 7% of the range and the losses occurred primarily prior to 1990. This lizard occurs in an area that has been impacted by long-term drought and this, along with the predicted negative effects of climate change in this region (Engelbrecht et al. 2015), may be an emerging threat.

Population trend: Because this lizard occurs mainly in an arid region that has not been impacted by habitat transformation, the population size is not thought to have declined overall. There may have been some local declines due to habitat loss in small parts of the range.

Conservation and research recommendations: Survey suitable habitat south of the Orange River to improve information regarding this species' distribution in South Africa and to assess whether mining and/or agricultural activities pose a threat.

Meroles cuneirostris, Gobabeb, Namibia (© G. Alexander).

Meroles cuneirostris, juvenile colouration, Gobabeb, Namibia (© G. Alexander).

Family **Lacertidae**

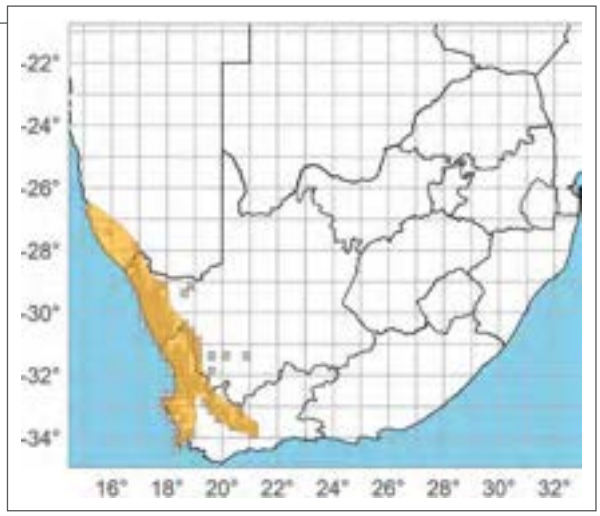
Meroles knoxii (Milne-Edwards, 1829)

Knox's Desert Lizard

South African near-endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This widely distributed species is abundant and tolerates some degree of habitat alteration.

Taxonomic notes: Two subspecies were previously recognised, *M. k. knoxii* from south of the Orange River in the Northern Cape province of South Africa and *M. k. pequensis* from north of the Orange River in Namibia based on slight differences in scalation, body size and egg clutch size (Branch 1998). However, these differences more likely reflect a morphological cline and geographic variation in life history within the species, as a contemporary study detected only population level structure across the range of this species (Strauss 2016). *Other important names*: none.

Distribution: Occurs from southwestern Namibia into South Africa along the western margin to the Cape Peninsula, and inland to the Little Karoo (Branch 1998). There are a few scattered records in the northeast of the distribution and inland above the Great Escarpment that require verification. These are not included in the distribution or the EOO estimate. *EOO*: 173 000 km^2; *Distribution*: 98 400 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in areas with sparse, shrubby vegetation, usually on sandy soils (Branch 1998). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: Given that this species is widespread and common, it is not considered to be in decline.

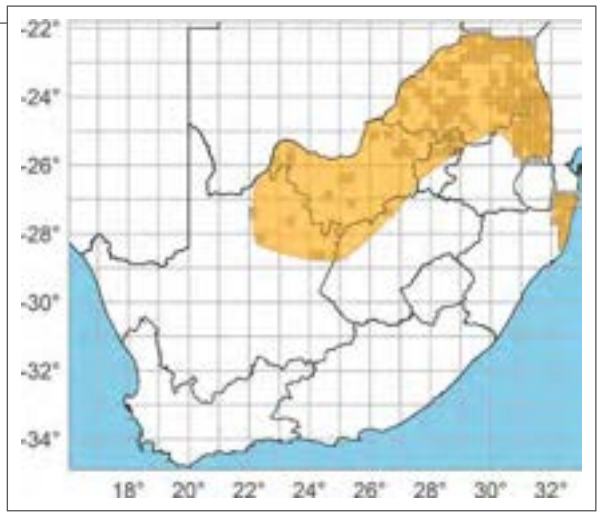
Conservation and research recommendations: No recommendations.

Meroles knoxii, Port Nolloth, Northern Cape province (© L. Kemp).

Family **Lacertidae**

Meroles squamulosus (Peters, 1854)

Common Rough-scaled Lizard, Savanna Lizard



LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species occurs over a large area that is not heavily impacted by habitat transformation and can be locally abundant.

Taxonomic notes: No notable issues. *Other important names*: *Ichnotropis squamulosa*.

Distribution: Widely distributed from southern Angola in the west and Tanzania in the east, southwards through Mozambique, into northern South Africa (Branch 1998; Spawls et al. 2018), possibly occurring in southern Democratic Republic of the Congo. The distribution enters South Africa in two areas, the Kalahari of South Africa, extending into the northeast, and in northern KwaZulu-Natal province. It may also occur in eastern Eswatini. *EOO*: 578 000 km^2; *Distribution*: 340 000 km^2.

Countries of occurrence: Angola, Botswana, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs on sandy or loose soils in both mesic and arid Savanna (Branch 1998). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species. Some parts of the distribution have been impacted by habitat loss, but the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.

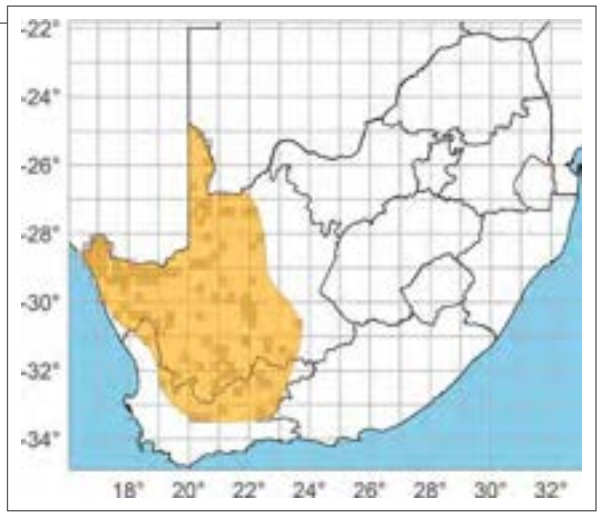
Meroles squamulosus, Klaserie, Limpopo province (© D.W. Pietersen).

Meroles suborbitalis (Peters, 1869)

Spotted Desert Lizard

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widely distributed, locally abundant, and not under any significant threats.

Taxonomic notes: There is some morphological variability across its range, possibly relating to cryptic taxa (Bauer & Branch 2003 [2001]). *Other important names*: none.

Distribution: Widely distributed from north-central Namibia southwards into the arid west of South Africa, including the western Great Karoo and Tankwa Karoo (Branch 1998). *EOO*: 420 000 km^2; *Distribution*: 318 000 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: This species occupies sparsely vegetated areas in desert and arid regions (Branch 1998), most often occurring on gravel or coarse sands. *Habitat*: Savanna, Shrubland, Desert.

Threats: There are no substantial threats to this species.

Population trend: Occurs in arid regions that have not been significantly impacted by habitat transformation, thus the population size is not thought to have declined.

Conservation and research recommendations: The hypothesis that this taxon may be a species complex should be evaluated in a phylogenetic framework.

Meroles suborbitalis, Aggeneys, Northern Cape province (© C. & S. Dorse).

Meroles suborbitalis, Steinkopf, Northern Cape province (© L. Kemp).

Family **Lacertidae**

Nucras aurantiaca Bauer, Childers, Broekhoven & Mouton 2019

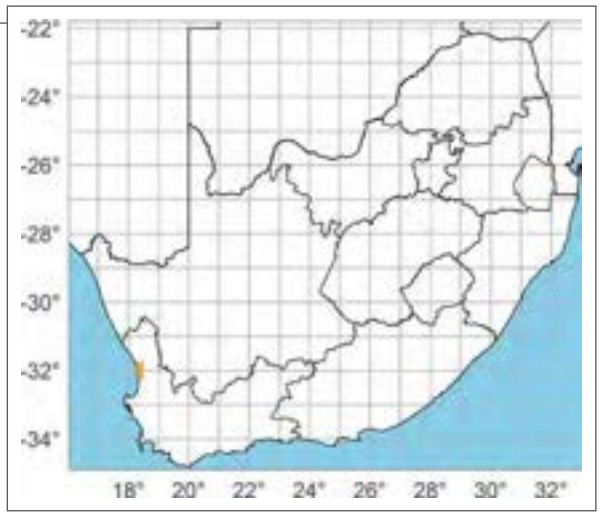
Orange Sandveld Lizard

DD – Data Deficient (Global)

Assessors: Tolley, K.A., Conradie, W., Weeber, J., Alexander, G.J., Pietersen, D.W.

Previous Red List categories:
2019: Data Deficient (Global IUCN assessment).

Assessment rationale: This species is known from only two localities, which are in different vegetation types and bioregions along the west coast of South Africa. Bauer et al. (2019) suggested that the species be considered Endangered due to declines in the EOO and AOO quality and extent because of agriculture and tourism activities. Recent land cover mapping indicates that 44% of the habitat in the area where the records were collected is heavily impacted by agriculture, but land use change associated with urbanisation and tourism is negligible (Geo Terra Image 2015; Skowno et al. 2019). However, nothing is known about the habitat association that defines the distribution of the species, so the EOO cannot be estimated with any confidence. Given the general area along the west coast of South Africa has undergone substantial habitat transformation (Geo Terra Image 2015, 2016), but that the EOO could range anywhere from tens of km² to thousands of km², the



Data Deficient category is appropriate until such time that additional records can be collected.

Taxonomic notes: There are no taxonomic issues. *Other important names*: none.

Distribution: This species occurs along the west coast of South Africa, recorded from only two localities, near Lambert's Bay. Two specimens were collected in 2005 on Farm Bosduifklip and one from Farm Fonteintjie in 2011 (incidental camera trap record), about 20 km north of Bosduifklip. Using the Lambert's Bay strandveld vegetation type as a proxy for occurrence, Bauer

Nucras aurantiaca, Lambert's Bay, Western Cape province (© C. Keates).

Nucras aurantiaca, male, Lambert's Bay, Western Cape province (© C. Keates).

et al. (2019) suggested it might occur from Donkin's Bay in the north to Elands Bay in the south. However, neither of the two locality records are from this vegetation type (see Habitat below). The distribution and EOO are therefore considered unknown at present.

Country of occurrence: South Africa.

Habitat and ecology: The two recorded localities are within the West Strandveld and Namaqualand Sandveld bioregions within the Fynbos biome (see Dayaram et al. 2019). The habitat is moderately impacted by sheep grazing at both localities. The species might be associated with loose, sandy substrate (Bauer et al. 2019). *Habitat*: Shrubland.

Threats: Natural habitats of the west coast of South Africa are under threat from large-scale, commercial agriculture, and 5% of the remaining natural habitat has been converted to agriculture since 1990, primarily for potato farming, and it is likely that this lizard would be affected by decline in the extent and quality of habitat. Land cover change associated with tourism (see Bauer et al. 2019) is not a significant part of the expanding human footprint. The total percentage of land cover associated with urbanisation is <1% of the area, and this has not shown a notable change across the larger landscape since 1990 (Geo Terra Image 2015, 2016). However, there have been several new strip-mining applications that are in various stages of approval, which could heavily impact the coastal margin and inland (https://www.protectthewestcoast.org/). An increase in mining could pose a threat to this species in the immediate future.

Population trend: Given that there are only three confirmed records from two localities, it is not possible to infer whether the species is stable or in decline. Furthermore, because species of *Nucras* tend to be naturally sparse in the landscape and difficult to detect, the paucity of records for *N. aurantiaca* cannot be used to imply rarity or declines.

Conservation and research recommendations: The overall region is considered an Endangered ecosystem (Skowno et al. 2019) and poorly protected, although there are several declared protected areas within the region and additional areas have been identified as priority focus areas in terms of the National Protected Area Expansion Strategy (Department of Environmental Affairs 2016). Thus, research that focuses on surveys of the area to collect additional locality data are paramount to better define the distribution of this species, and the extent of historical and current habitat transformation within the range of the species needs to be assessed. Research on the extent of emerging pressures is required to assess population trends, i.e., the expanding mining footprint should be monitored to assess further declines in habitat quality and extent.

Family **Lacertidae**

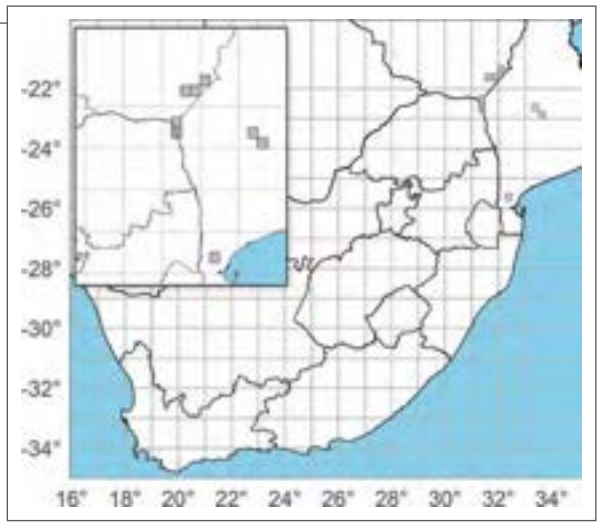
Nucras caesicaudata Broadley, 1972

Blue-tailed Sandveld Lizard

South African peripheral

DD – Data Deficient (Global)

Assessors: Pietersen, D.W., Alexander, G.J., Tolley, K.A., Conradie, W., Verburgt, L., Weeber, J., Farooq, H.



Previous Red List categories:
2021: Data Deficient (Global IUCN assessment).

Assessment rationale: Listed as Data Deficient on the basis that, although this species is reported to have a wide range encompassing multiple well-managed protected areas, it has not been recorded since the 1980s, for reasons that are unknown and might relate either to levels of survey effort or a genuine population decline as a result of unidentified drivers.

Taxonomic notes: No issues. *Other important names*: none.

Distribution: This lizard has been recorded from the Gazaland Plain in southern Mozambique, in southeastern Zimbabwe and just into South Africa (Broadley 1972). It is known from specimens collected in Gonarezhou National Park in Zimbabwe, the northern extremes of Kruger National Park in South Africa and scattered localities in southern Mozambique.

Countries of occurrence: Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Little is known about the natural history of this lizard, although it appears to be associated with arid Savanna on deep sand (Broadley 1972; Pienaar et al. 1983). It is likely to be associated with Nwambiya Sandveld Thicket vegetation. Some observations have been made that possibly suggest this lizard actively forages after bouts of rain (see Broadley 1972), probably due to an increase in insect (prey) availability. *Habitat*: Savanna.

Threats: Although there are no known threats to this species and most records have been taken within well-managed protected areas, it has not been

Nucras caesicaudata, Kruger National Park, Limpopo province (© W.D. Haacke).

recorded in more than 30 years. Given the available information, it is impossible to evaluate whether the lack of records represents a genuine population decline driven by unknown factors or whether the fairly limited survey effort and the presumed low detection probability for this species have hampered the collection of records.

Population trend: The type series consisted of 49 specimens most of which were collected during a single survey in Zimbabwe (Broadley 1972). A further 13 individuals have been recorded from sites elsewhere in the range, collected over several years. The high number of specimens collected during a single survey (Broadley 1972) suggests that it may be locally common, or the population may fluctuate. However, this lizard has not been recorded for over 30 years, and most records date from the 1960s from the original type series. The most recent record appears to be from 1989, taken in Limpopo National Park, Mozambique. In South Africa, all records are from Kruger National Park made in the 1960s (Pienaar et al.1978).

Members of this genus are generally considered to be difficult to detect and the activity of this species may be linked to environmental conditions (Broadley 1972). Few herpetological surveys have been conducted within the appropriate areas of this lizard's presumed range, but it is expected to still occur in northern Kruger National Park, South Africa (not surveyed for at least a decade), Banhine National Park, Mozambique (not surveyed since the early 2000s), Limpopo National Park, Mozambique (no herpetological surveys) and Gonarezhou National Park, Zimbabwe (recently explored by researchers but with no dedicated herpetological fieldwork since about 1980). Although the species is known from the regularly visited Kruger and Gonarezhou national parks, suitable habitat exists only in areas of these national parks that are either rarely visited or inaccessible to both tourists and herpetologists, and incidental observations are therefore unlikely.

Despite the absence of significant survey effort, it is still surprising that the species has not been detected in the last several decades. Thus, the population trend is unknown. There are no obvious threats to the habitat and no obvious land management shifts within these national parks where the species was historically recorded. However, the absence of recent records in these areas that appear to be suitable could possibly indicate a decline.

Conservation and research recommendations: The species has been recorded from Kruger National Park, Limpopo National Park, Banhine National Park and Gonarezhou National Park. Occurrence in northern South Africa, southeastern Zimbabwe and adjacent southern Mozambique requires confirmation to assess the distribution and to identify any threats. This could allow for an evaluation of whether the lack of records reflects a population decline or is the result of poor survey effort relative to the low detectability.

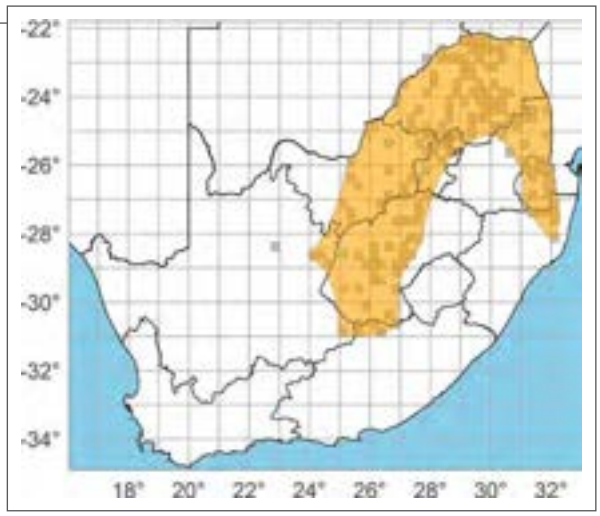
Family **Lacertidae**

Nucras holubi (Steindachner, 1882)

Holub's Sandveld Lizard

LC – Least Concern (Regional)

Assessors: Burger, M., Tolley, K.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread with no substantial threats.

Taxonomic notes: The disjunct *N. holubi* population in northern Namibia is now referable to *N. damarana* (Bauer et al. 2020). Recent phylogenetic studies have shown two divergent clades in *N. holubi* that require further investigation (Branch et al. 2019b) and that *N. holubi* may be polyphyletic with respect to *N. damarana* (Bauer et al. 2020). *Other important names*: none.

Distribution: Widespread in the mesic eastern areas of southern Africa, possibly extending into Mozambique. In the region, it occurs from the central part of South Africa, extending northwards into Limpopo province, Eswatini and northern KwaZulu-Natal province. *EOO*: 586 000 km²; *Distribution*: 361 000 km².

Countries of occurrence: Botswana, Eswatini, Malawi, South Africa, Zimbabwe.

Habitat and ecology: Often associated with rocky terrain in Mesic Savanna in the north and sandy plains in the south. As is typical for most *Nucras*, this species shelters in burrows in the ground or under rocks and probably occurs at low densities. *Habitat*: Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: Although there is some habitat transformation in parts of the range, the population size is assumed to be stable because this is a widespread species, and the extent of habitat transformation is small in relation to the large range.

Conservation and research recommendations: No recommendations.

Nucras holubi, Oviston Nature Reserve, Eastern Cape province (© W. Conradie).

Nucras holubi, Greater Kuduland Safaris, Limpopo province (© M. Burger).

Nucras intertexta (Smith, 1838)

Spotted Sandveld Lizard

LC – Least Concern (Regional)

Assessors: Burger, M., Tolley, K.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Relatively widely distributed with no substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: From central South Africa to southern Zimbabwe and westward to northern Namibia (Branch 1998). In the region, it occurs from arid central South Africa to the mesic northeast, extending into northern KwaZulu-Natal province through Mozambique. *EOO*: 670 000 km²; *Distribution*: 349 000 km².

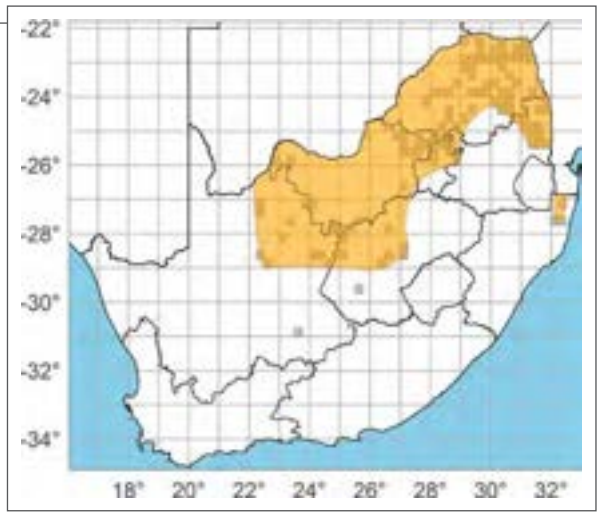
Countries of occurrence: Botswana, Mozambique, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Associated with sandy or rocky substrates in Open Arid and Mesic Scrubland and peripherally in Grassland and probably occurs at low densities. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Although there is some habitat transformation in parts of the range, the population size is assumed to be stable because this is a widespread species, and the extent of habitat transformation is small in relation to the large range.

Conservation and research recommendations: No recommendations.



Nucras intertexta, Postmasburg, Northern Cape province (© G.K. Nicolau).

Nucras intertexta, Soutpansberg, Limpopo province (© M. Petford).

Family **Lacertidae**

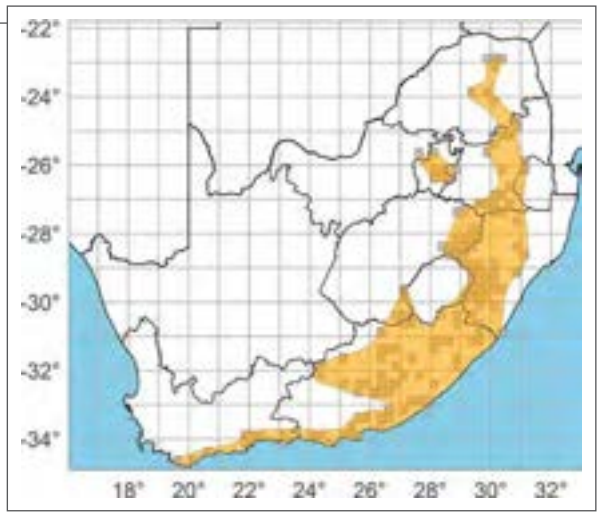
Nucras lalandii (Milne-Edwards, 1829)

Delalande's Sandveld Lizard

Regional endemic

LC – Least Concern (Global)

Assessors: Burger, M., Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widely distributed, but within its range it is generally limited to montane habitats. Although habitat quality in some areas has been negatively impacted by afforestation and increased burning for agricultural purposes, these impacts are not considered significant threats.

Taxonomic notes: A molecular phylogeny of the genus shows deep divergence within the species, which could indicate cryptic diversity (see Branch et al. 2019b). *Other important names*: none.

Distribution: Occurs in southern and eastern South Africa (Jacobsen 1989; Bourquin 2004) extending marginally into Eswatini and Lesotho (De Waal 1978; Boycott 1992a; Bates 1996b; Ambrose 2006). There is a subpopulation centred in Gauteng province that might be disjunct from the main distribution. *EOO*: 659 000 km^2; *Distribution*: 258 000 km^2.

Countries of occurrence: Eswatini, Lesotho, South Africa.

Habitat and ecology: Generally associated with Montane and Temperate Grassland in the north, and Fynbos habitat in the south. As is typical for most sandveld lizards, it shelters in burrows or under rocks. The elevational range is from near sea level to

Nucras lalandii, Wakkerstroom, KwaZulu-Natal province (© D.W. Pietersen).

Nucras lalandii, Ntsikeni Wildlife Reserve, KwaZulu-Natal province (© D.W. Pietersen).

Nucras lalandii, Nieu-Bethesda, Eastern Cape province (© L. Kemp).

2 300 m a.s.l. (Jacobsen 1989; Branch 1998). *Habitat*: Savanna, Shrubland, Grassland.

Threats: There are minor threats from habitat loss in montane regions due to afforestation, particularly in Mpumalanga, Limpopo, KwaZulu-Natal and Eastern Cape provinces (CSIR 2008) and frequent burning of Montane Grasslands. These factors degrade the habitat quality and increase fragmentation of sub-populations.

Population trend: Although there is some habitat modification in parts of the range, the majority of the distribution is not highly impacted. The widespread distribution and abundance mitigate against the negative effects of local population declines.

Conservation and research recommendations: A molecular phylogeny with comprehensive geographic sampling and a morphological analysis is needed to assess the presence of cryptic taxa within *N. lalandii*.

Family **Lacertidae**

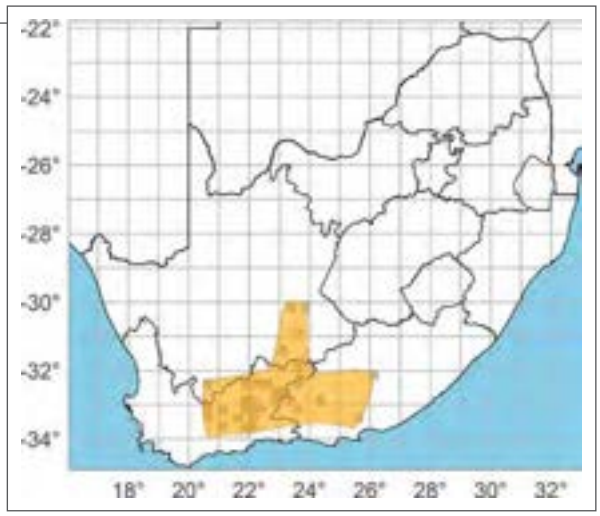
Nucras livida (Smith, 1838)

Karoo Sandveld Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Burger, M., Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no significant threats.

Taxonomic notes: Records from the west coast of South Africa previously assigned to this taxon have been reassigned to *N. tessellata* (Conradie et al. 2020), and thus there are no outstanding taxonomic issues. *Other important names*: none.

Distribution: This widespread species occurs in southern South Africa, from the Cape Fold Mountains and the Great Karoo, along the Great Escarpment and into the high-elevation mountains of the Eastern Cape province. *EOO*: 190 000 km²; *Distribution*: 113 000 km².

Country of occurrence: South Africa.

Habitat and ecology: Associated with well-vegetated Karroid Vegetation on sandy flats and in mountainous terrain (Branch 1998). *Habitat*: Shrubland.

Threats: There are no notable threats to this species.

Population trend: This species is widespread across a region that has little habitat alteration. It is therefore not considered to be in decline.

Conservation and research recommendations: No recommendations.

Nucras livida, Karoo National Park, Western Cape province (© W. Conradie).

Family **Lacertidae**

Nucras ornata (Gray, 1864)

Ornate Sandveld Lizard

LC – Least Concern (Regional)

Assessors: Burger, M., Tolley, K.A.

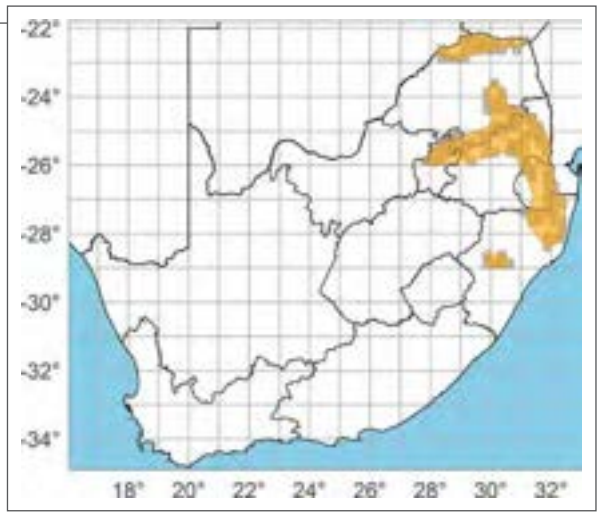
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread with no significant threats.

Taxonomic notes: Historical records of *Nucras* from Namibia (Broadley 1972) had been assigned to *N. taeniolata ornata*. However, with the elevation of *N. taeniolata* to full species, these records were not reassigned (Jacobsen 1989; Bates 1996b; Bauer et al. 2020). Records from northwest Namibia are now referable to *N. damarana* while those from central Namibia refer to *N. intertexta*, thus no records of *N. ornata* exist for Namibia (Bauer et al. 2020). *Other important names*: none.

Distribution: Occurs across southern Africa, from northern Mozambique and southern Malawi into southern Zambia (Broadley 1972). In the region, it occurs in the northeast, extending into northern KwaZulu-Natal province. There are several historical records from central KwaZulu-Natal province (Bourquin 2004) about 150 km to the southwest of the main population. *EOO*: 260 000 km^2; *Distribution*: 92 000 km^2.

Countries of occurrence: Eswatini, Malawi, Mozambique, South Africa, Zambia, Zimbabwe.



Habitat and ecology: Frequents grass tussocks and leaf litter on rocky hillsides in Montane Grassland and Mesic Savanna (Jacobsen 1989). It often occupies burrows in the ground, including burrows under rocks (Jacobsen 1989) and generally occurs at low densities. *Habitat*: Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: Although there is some habitat transformation in parts of the range, the population size is assumed to be stable because this is a widespread species, and the extent of habitat transformation is small in relation to the large range.

Conservation and research recommendations: Museum specimens representing the central KwaZulu-Natal province records should be re-examined to confirm their identity, given that the taxonomy of *Nucras* has been in flux.

Nucras ornata, juvenile colouration, Lebombo Mountains, KwaZulu-Natal province (© D. van Eyssen).

Nucras ornata, Kaapschehoop, Mpumalanga province (© L. Kemp).

Family **Lacertidae**

Nucras taeniolata (Smith, 1838)

Albany Sandveld Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Burger, M., Conradie, W., Weeber, J., Pietersen, D.W., Alexander, G.J.

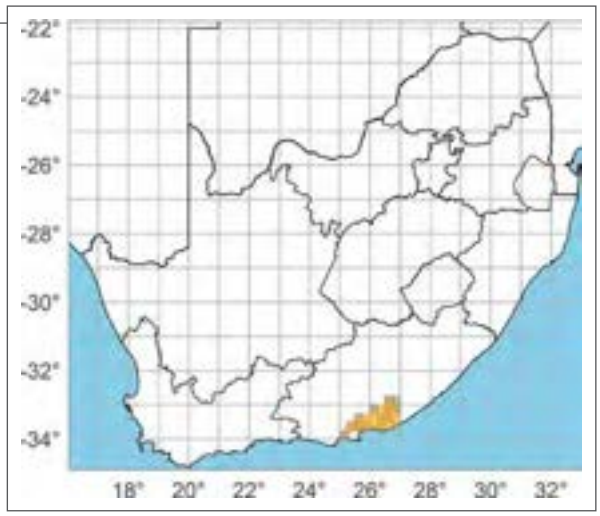
Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a fairly small range, and although there has been some decline in the extent and quality of habitat, at least 80% of the habitat is intact. Previously considered Near Threatened based on a continuing decline in habitat quality and extent and a decline in the number of individuals. However, the most recent land cover layer shows that the majority of habitat transformation was prior to 1990. The continuing habitat loss is relatively minor and mostly occurs in the area surrounding Addo Elephant National Park.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Nucras taeniolata, Makhanda, Eastern Cape province (© C. Keates).



Distribution: Occurs only in the southeastern parts of the Eastern Cape province, South Africa. A new photographic record (G. Nicolau, unpubl. data 2021) allows for an improved estimate of the range and provides a link between the eastern and western records. *EOO*: 11 500 km^2; *Distribution*: 8 750 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on both soft and hard soils, and on shale in mesic environments, where it may burrow at the base of bushes or shelter under rock slabs (Branch & Braack 1987; Fabricius et al. 2002). Elevation ranges from 50 to 500 m a.s.l. *Habitat*: Savanna, Shrubland.

Threats: There is some habitat transformation in the area including crop cultivation, overgrazing by livestock, urban and industrial developments, afforestation and alien plant infestations.

Population trend: *Nucras taeniolata* occurs in several protected areas and mega-conservancy networks and protected area expansions are earmarked for the region (Hoare et al. 2006). It is therefore likely to maintain a viable long-term presence in spite of some habitat transformation. Although local declines are likely, the overall population is suspected to be stable given the fairly widespread range and abundance of this species that mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Family **Lacertidae**

Nucras tessellata (Smith, 1838)

Western Sandveld Lizard

LC – Least Concern (Regional)

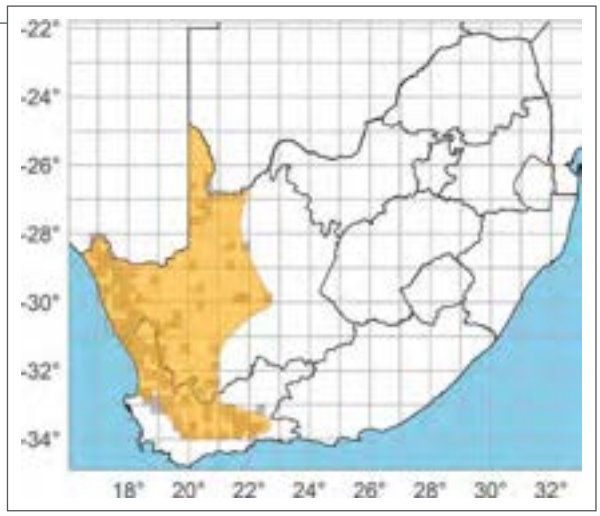
Assessors: Burger, M., Tolley, K.A.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a wide distribution in areas that are not under substantial anthropogenic threat.

Taxonomic notes: There is considerable morphological, colour (see Broadley 1972) and genetic variation (see Branch et al. 2019b) within *N. tessellata*, with several subspecies and varieties having been recognised. Some issues have been resolved, such as the elevation of *N. t. livida* to a full species and the description of *N. broadleyi* from Angola. However, other issues such as the taxonomic status of 'varieties' (*N. t. tessellata* var. *elegans* and *N. t. tessellata* var. 'T') and the notable genetic variation within *N. tessellata sensu stricto* (Branch et al. 2019b) require further investigation. *Other important names*: none.

Distribution: This species is widely distributed in western South Africa as far south as the Cape Fold Mountains and north into the Kalahari region, extending into central Namibia and southwestern Botswana (Broadley 1972). *EOO*: 420 000 km²; *Distribution*: 266 000 km².



Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: Occurs in a wide range of vegetation types including Savanna, Karroid Veld, Succulent Karoo and Fynbos, often using dry

Nucras tessellata, Sutherland, Karoo (© N. Telford).

Family **Lacertidae**

Nucras tessellata var. *elegans*, Aggeneys, Northern Cape province (© M. Burger).

Nucras tessellata, near Calitzdorp, Western Cape province (© T. Ping).

riverbeds or areas with rocky terrain (Branch 1998). It likely occurs at low abundances. *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: There is considerable morphological and genetic variation within *N. tessellata*, and this requires an assessment within a phylogenetic framework with comprehensive geographic sampling.

Family **Lacertidae**

Pedioplanis burchelli (Duméril & Bibron, 1839)

Burchell's Sand Lizard

Regional endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Turner, A.A.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and abundant species with no substantial threats to its habitat.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs across much of southeastern and central South Africa and Lesotho. In South Africa it ranges from Mpumalanga province southwest to the Eastern and Western Cape provinces throughout the Cape Fold Mountains and the Great Escarpment, extending marginally into the Great Karoo. There is an isolated, northern record (Rietfontein) in western Mpumalanga province (Jacobsen 1989). *EOO*: 526 000 km^2; *Distribution*: 345 000 km^2.

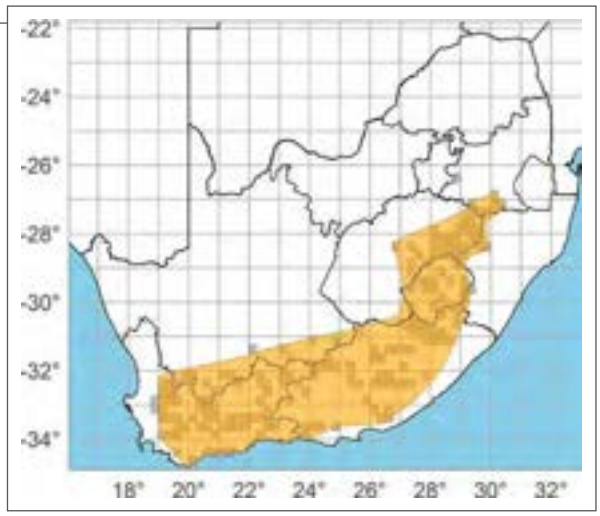
Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: Most often associated with mountain slopes or plateaus, particularly in rocky or gravelly areas, with exposed bedrock and sparse vegetation (Branch 1998). *Habitat*: Savanna, Shrubland, Grassland.

Threats: There are no major threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.



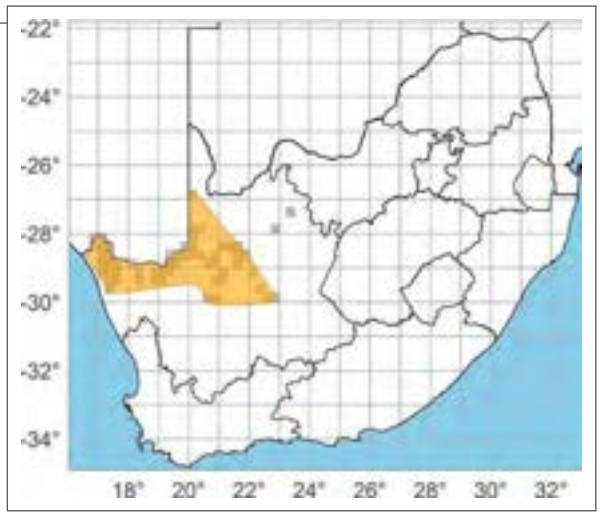
Pedioplanis burchelli, Swartberg Pass, Western Cape province (© T. Ping).

Pedioplanis burchelli, Letseng Mine, Lesotho (© L. Verburgt).

Family Lacertidae

Pedioplanis inornata (Roux, 1907)

Plain Sand Lizard



LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a fairly wide distribution in northwestern South Africa, in areas that are not heavily impacted by human activities.

Taxonomic notes: *Pedioplanis inornata* is paraphyletic with respect to *P. gaerdesi*, with separate clades in coastal central Namibia, central Namibia and the Northern Cape province of South Africa. These clades likely represent different species (Makokha et al. 2007) and the northern Namibia clade was subsequently described as new, *P. branchi* (Childers et al. 2021). *Other important names*: none.

Distribution: Occurs from the arid portions of northwestern South Africa, northwards to central Namibia (Childers et al. 2021). There are scattered records 150–200 km to the east of the main range, in the northeast Northern Cape province, South Africa. *EOO*: 191 000 km²; *Distribution*: 89 200 km².

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Primarily occurs in Nama-Karoo and Succulent Karoo habitats on coarse sandy substrates. *Habitat*: Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this lizard occurs in an arid region that has not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: The taxonomic status of the two paraphyletic clades (Makokha et al. 2007) requires assessment. Additional records from northeast Northern Cape province would allow for a better assessment of the extent of the distribution.

Pedioplanis inornata, Tantalite Valley, southern Namibia (© L. Kemp).

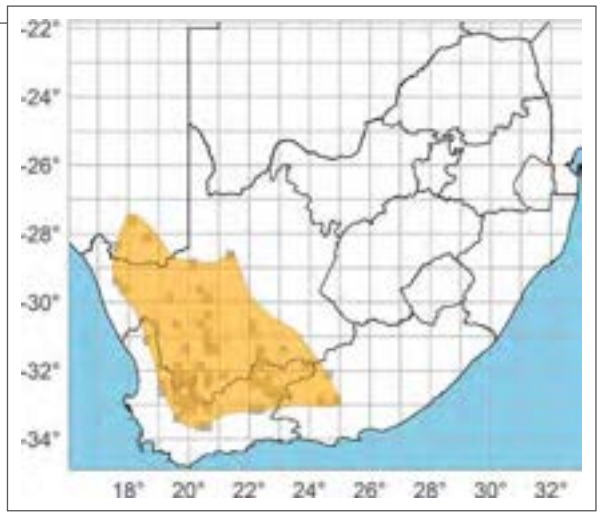
Pedioplanis laticeps (Smith, 1845)

Karoo Sand Lizard

South African near-endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: A widespread species with no substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs in the arid southwestern interior portion of South Africa from the Cape Fold Mountains, into the Great Karoo and to the southern Kalahari, extending marginally into southern Namibia (Kirchhof et al. 2017). *EOO*: 288 300 km^2; *Distribution*: 250 750 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs on hard-packed and gravelly soils in a variety of vegetation types including Succulent Karoo, Nama-Karoo, Fynbos and Albany Thicket (Branch 1998). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Pedioplanis laticeps, Karoo National Park, Western Cape province (© W. Conradie).

Pedioplanis laticeps, Karoo National Park, Western Cape province (© W. Conradie).

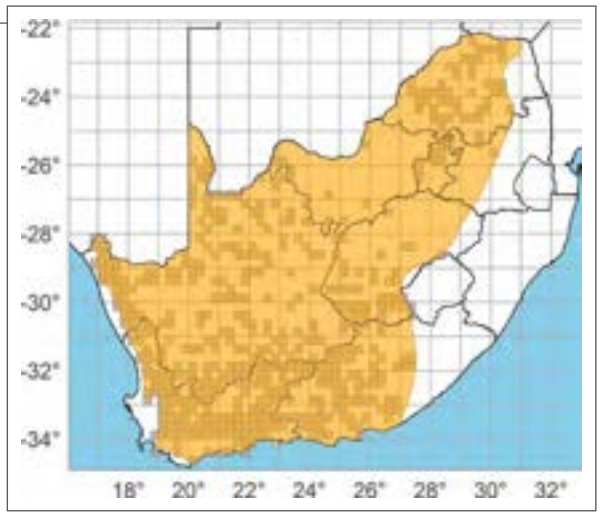
Family **Lacertidae**

Pedioplanis lineoocellata (Duméril & Bibron, 1839)

Spotted Sand Lizard

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Pedioplanis lineoocellata lineoocellata* – Least Concern (SARCA).
2014: *Pedioplanis lineoocellata pulchella* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Pedioplanis lineoocellata lineoocellata* (Duméril & Bibron, 1839).
- *Pedioplanis lineoocellata pulchella* (Gray, 1845).

Assessment rationale: This species is common and widespread. Anthropogenic activity within its distribution is limited and the species can tolerate some habitat disturbance.

Taxonomic notes: Although three subspecies are recognised (*P. l. lineoocellata, P. l. pulchella* and *P. l. inocellata*), their ranges overlap (see Bates et al. 2014) and they lack morphological differentiation (Edwards 2013). Makokha et al. (2007) suggested there were genetic differences between the subspecies, but their study included very few localities and the genetic structure was not deep. Sampling from multiple localities across the range of the subspecies suggests that while there is some genetic structuring, it does not match the geographic pattern of occurrence of the subspecies. Thus, there appears to be

Pedioplanis lineoocellata pulchella, Coega, Eastern Cape province (© L. Kemp).

Pedioplanis lineoocellata pulchella, Murraysburg, Western Cape province (© L. Kemp).

Pedioplanis lineoocellata lineoocellata, Van Zylsrus, Northern Cape province (© G.K. Nicolau).

little support for the currently recognised subspecies (Edwards 2013). *Other important names*: none.

Distribution: Widespread in the arid regions of southern Africa. In South Africa it ranges from northern Limpopo province, southwestwards into the Western Cape province. *EOO*: 1 280 000 km^2; *Distribution*: 965 000 km^2.

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: This species occurs in several habitat types and appears to be tolerant of some agricultural activities, such as low intensity grazing where some original vegetation is still intact. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no significant threats to this species.

Population trend: Because this lizard is widespread in areas that have not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: The validity of the subspecies requires a formal assessment.

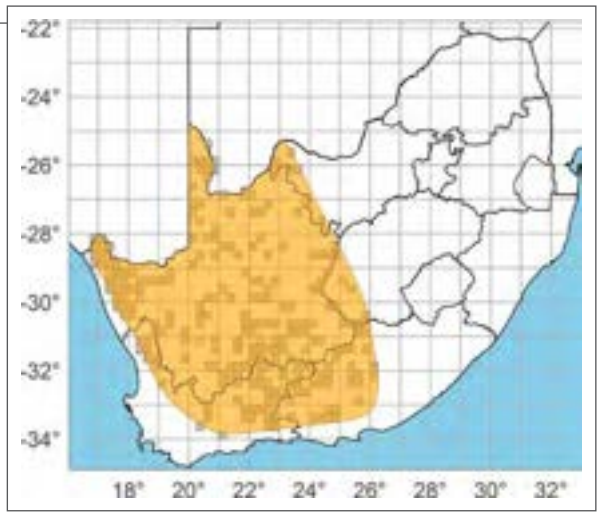
Family **Lacertidae**

Pedioplanis namaquensis (Duméril & Bibron, 1839)

Namaqua Sand Lizard

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is abundant and widespread, and there is relatively limited habitat loss within its distribution.

Taxonomic notes: A phylogenetic analysis indicated that *Pedioplanis namaquensis* most likely consists of two distinct taxa, one in Namibia and the other in South Africa (Makokha et al. 2007), but the geographic patterns of occurrence of the two taxa is still unclear. *Other important names*: none.

Distribution: Widely distributed in the western arid regions of South Africa, extending northwards to northern Namibia and eastern Botswana (Branch 1998). *EOO*: 646 000 km²; *Distribution*: 527 000 km².

Countries of occurrence: Botswana, Namibia, South Africa.

Pedioplanis namaquensis, southern Namibia (© G. Alexander).

Pedioplanis namaquensis, Springbok, Northern Cape province (© T. Ping).

Pedioplanis namaquensis, Steinkopf, Northern Cape province (© L. Kemp).

Habitat and ecology: Inhabits sandy substrates in Karroid Veld, Arid Savanna and Semi-Desert. Digs its own burrows in sand at the base of bushes (Branch 1998). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this lizard occurs mainly in an arid region that has not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: The taxonomic status of the two divergent clades (Makokha et al. 2007) and their respective distributions should be assessed. Comprehensive geographic sampling is required to adequately resolve this issue.

Family **Lacertidae**

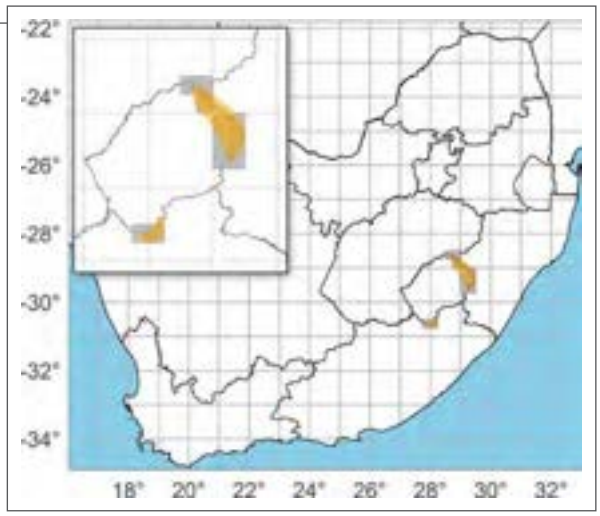
Tropidosaura cottrelli (Hewitt, 1925)

Cottrell's Mountain Lizard

Regional endemic

LC – Least Concern (Global)

Assessors: Cunningham, M.J., Tolley, K., Bates, M.F., Turner, A.A.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
2011: Near Threatened (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: The vast majority of this lizard's habitat is essentially intact and is within protected areas. In some areas, frequent fires, overgrazing and increased agriculture might impact this species, but this would be in a very small part of the range. In addition, it has been recorded from slightly degraded habitat suggesting that it has some level of tolerance to disturbance (W. Conradie, pers. comm. 2021). Previously considered Near Threatened based on the impact of climate change that would affect the small AOO. However, this is speculative and requires niche modelling for confirmation.

Taxonomic notes: There are no taxonomic issues. *Other important names*: none.

Distribution: Occurs in the Drakensberg highlands of South Africa and Lesotho, apparently in two subpopulations: northern Drakensberg from south of Golden Gate through most of the Maloti–Drakensberg, and the southern Drakensberg near Naude's Nek (Branch 1998; Bates 2013). It probably also occurs in the area between the documented northern

Tropidosaura cottrelli, Letseng, Lesotho (© W. Conradie).

Tropidosaura cottrelli, Letseng Mine, Lesotho (© L. Verburgt).

and southern subpopulations and the range could be more extensive in Lesotho than records currently suggest. The species occurs along the crests of mountain ridges and along the escarpment summit edge and because the area is poorly surveyed, it is likely that the distribution is more continuous than current data suggest. *EOO*: 16 470 km^2; *Distribution*: 4 510 km^2.

Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: This species typically inhabits stony, heath- and grass-covered mountaintops near the escarpment edge of the Drakensberg and along the interior high ridges of Lesotho, at elevations of 2 500–3 300 m a.s.l. These exposed, weather-beaten sites typically include small boulders, low shrubs (particularly *Erica* and Asteraceae species), short grass and bare patches of gravel or bedrock. Has been recorded from degraded habitats (W. Conradie, pers. comm. 2021). *Habitat*: Grassland.

Threats: Because this lizard occurs mainly in an area where the habitat is intact, it is unlikely to face significant threats. Nevertheless, in some areas, especially at the lowest elevations, there could be a minor threat from overgrazing and habitat degradation (Stewart 2001). Climate change may also reduce suitable habitat at the highest elevations and could constitute a future threat as there is limited opportunity for an elevational response. The species might occur at low densities, which could make it more sensitive to emerging threats.

Population trend: Although the habitat is relatively intact, there are few records and it is not known whether these low densities are natural, or if the species is difficult to detect.

Conservation and research recommendations: Measures of density and additional surveys of suitable areas where the species has not yet been recorded would be invaluable for future assessments and facilitate assessment of the impacts of threats. Niche modelling to assess the impacts of climate change is needed.

Family **Lacertidae**

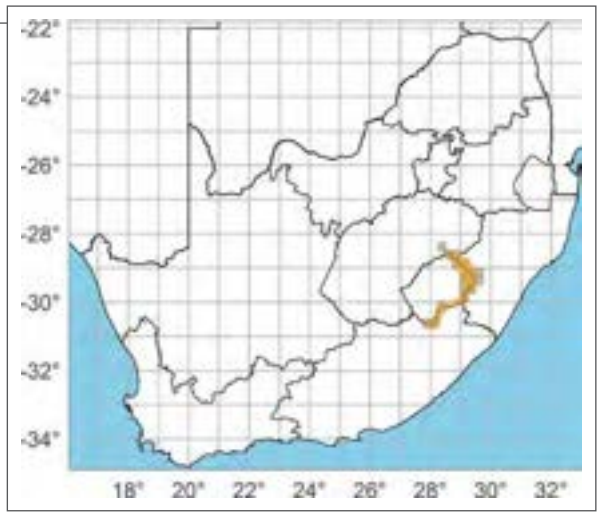
Tropidosaura essexi Hewitt, 1927

Essex's Mountain Lizard

Regional endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Bates, M.F., Cunningham, M.J., Turner, A.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: The habitat in which this species occurs has undergone minimal transformation. The species is locally abundant with a large distribution and no indication of population declines.

Taxonomic notes: There is substantial morphological variation within *T. essexi* with regards to the number of femoral pores, colour pattern and mitochondrial DNA sequences that could represent cryptic taxa (M.J. Cunningham, unpubl. data 2014). *Other important names*: none.

Distribution: Occurs across the Maloti–Drakensberg mountain range of Lesotho and South Africa at high elevations. There appears to be elevational separation between the Drakensberg subpopulation of Common Mountain Lizard (*T. montana natalensis*) and the morphologically similar *T. essexi*, which occurs at higher elevation (2 400–3 400 m). *EOO*: 24 000 km^2; *Distribution*: 10 100 km^2.

Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: This species occurs in short basalt Grasslands and Afro-Alpine Heathlands on the high escarpment slopes and plateau (± 2 400–3 400 m a.s.l.). It has been recorded from thick vegetation at the edges of streams, around loose

Tropidosaura essexi, female colouration, Letseng Mine, Lesotho (© L. Verburgt).

Tropidosaura essexi, male colouration, Letseng Mine, Lesotho (© L. Verburgt).

rocks in wetlands or at the base of rock faces (Branch 1998). *Habitat*: Grassland.

Threats: Although the habitat in most of the geographic range is still intact, the habitat quality of small parts of the range has declined due to overgrazing and increased fire frequency. Because the species appears to be locally abundant, it is probably at low risk from these threats. Climate change may also reduce suitable habitat at the highest elevations and could constitute a future threat as there is limited opportunity for an elevational response. Nevertheless, this species has evolved viviparity and this might provide some flexibility in terms of buffering for changing thermal environment (Nicolau et al. 2022).

Population trend: The species is not considered to be in decline at present, as it is widespread and locally abundant. This mitigates against any local declines in areas where habitat quality is impacted.

Conservation and research recommendations: Further investigation is required to assess the presence of cryptic taxa within *T. essexi*. Niche modelling to assess the impacts of climate change is needed.

Family **Lacertidae**

Tropidosaura gularis Hewitt, 1927

Cape Mountain Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Turner, A.A.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This is a widely distributed species occurring in areas where there has been little human disturbance with no significant threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Distributed along the southern margin of South Africa throughout most of the Cape Fold Mountains and associated areas. There is a small, isolated population in the mountains of the Cape Peninsula. *EOO*: 49 800 km^2; *Distribution*: 41 500 km^2.

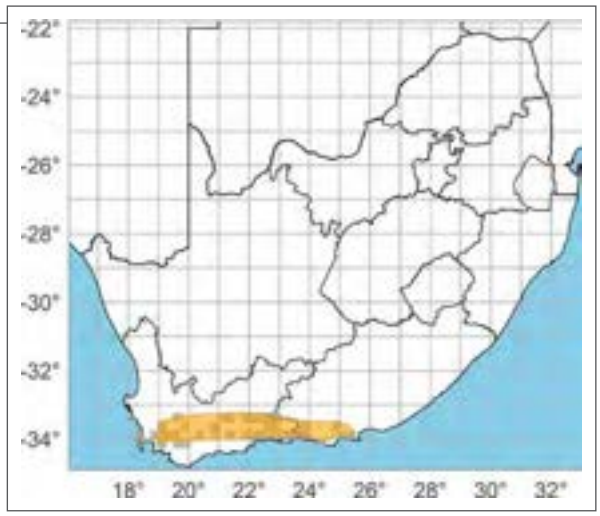
Country of occurrence: South Africa.

Habitat and ecology: Occurs in the Fynbos vegetation of mountain slopes where there is scree and other loose boulders. *Habitat*: Shrubland.

Threats: There are no notable threats.

Population trend: This species is not considered to be in decline, given that it has a wide distribution area, which is not heavily impacted by habitat transformation.

Conservation and research recommendations: No recommendations.



Tropidosaura gularis, Kogelberg Biosphere Reserve, Western Cape province (© C. & S. Dorse).

Tropidosaura gularis, Swartberg, Western Cape province (© C. & S. Dorse).

Family **Lacertidae**

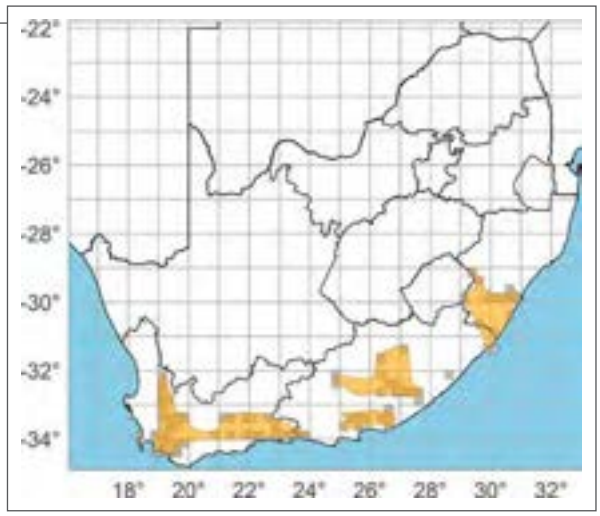
Tropidosaura montana (Gray, 1831)

Common Mountain Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Turner, A.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Subspecies included under this assessment:
- *Tropidosaura montana montana* (Gray, 1831).
- *Tropidosaura montana natalensis* FitzSimons, 1947.
- *Tropidosaura montana rangeri* Hewitt, 1926.

Assessment rationale: This species is widespread and abundant and most of its geographic range is not threatened by habitat loss.

Taxonomic notes: The currently recognised subspecies (*T. m. montana*, *T. m. rangeri* and *T. m. natalensis*) show varying degrees of genetic differences from little DNA sequence variation between *T. m. montana* and *T. m. rangeri* (Edwards et al. 2012) to a slightly higher difference between *T. m. montana* and *T. m. natalensis* (Engleder et al. 2013). However, this inference is based on very few samples and few sequenced genes, particularly for *T. m. natalensis*, and the slightly higher divergence for that subspecies could be a function of isolation by distance. *Other important names*: none.

Distribution: *Tropidosaura montana* has a patchy distribution in the more mountainous regions of the south and southeastern margin of South Africa and eastern Lesotho. The three subspecies (*T. m. montana* – Cape Fold Mountains, *T. m. rangeri* – southern Eastern Cape province, *T. m. natalensis* – Drakensberg) were thought to be in separate subpopulations (Turner 2014b), but the addition of recent records suggests it is likely that the subspecies are not geographically distinct, and the patchiness of the distribution might be an artefact of sampling effort. Furthermore, the genetic similarity between *T. m. montana* and *T. m. rangeri* further suggests the distribution may be fairly continuous between

*Tropidosaura montana montana*l, Porterville, Western Cape (© C. & S. Dorse).

Family **Lacertidae**

Tropidosaura montana natalensis, Mkambati Nature Reserve, Eastern Cape province (© W. Conradie).

Tropidosaura montana rangeri, Hogsback, Eastern Cape province (© W. Conradie).

those subspecies. Nevertheless, the range of *T. m. natalensis* in the Drakensberg requires further clarification as there is an apparent gap between this subspecies and the others. *EOO*: 380 000 km²; *Distribution*: 83 800 km².

Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: Occurs in a variety of vegetation types. In the southern part of the range, this lizard occurs in Fynbos vegetation, often in stands of short restios, while in the eastern part of the range it occurs on dense grassy slopes and appears to be abundant around seepage areas with tall, tufted grasses such as *Merxmuellera* species (Turner 2014b). Individuals have been observed basking in long, dense grass (Turner 2014b). *Habitat*: Shrubland, Grassland.

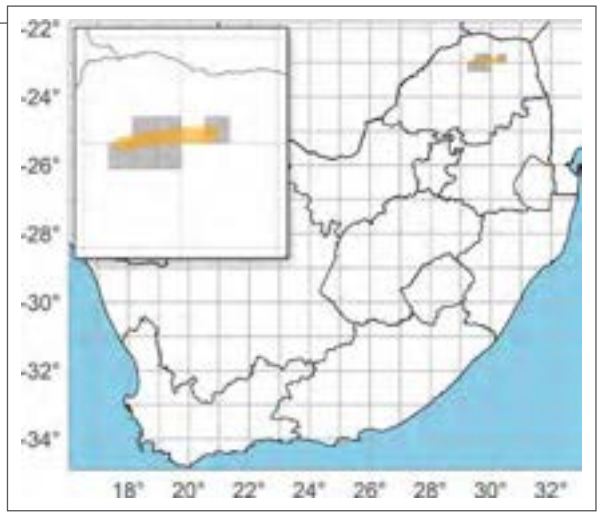
Threats: Overgrazing of Grasslands could be a threat to this species, but this is not considered significant at present.

Population trend: Given the widespread range, which is not heavily impacted by habitat loss, the species is not thought to be in decline.

Conservation and research recommendations: Given that current knowledge is lacking with respect to the status of the three subspecies, their taxonomic status should be assessed in a phylogenetic framework using increased sampling from across the range.

Vhembelacerta rupicola (FitzSimons, 1933)

Soutpansberg Rock Lizard



South African endemic

LC – Least Concern (Global)

Assessors: Alexander, G.J., Tolley, K.A., Turner, A.A., Conradie, W., Pietersen, D.W., Weeber, J.

Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Near Threatened (Global IUCN assessment) as *Australolacerta rupicola*.
1994: Near Threatened (Global IUCN assessment) as *Lacerta rupicola*.

Reason for recent change: Non-genuine.

Assessment rationale: This species has a small distribution, but there are no substantial threats to most of its range at present. Although there was an inferred past decline in the extent and quality of suitable habitat due to alien plantations in the eastern part of its range, there is currently no evidence that this threat is ongoing. Previously considered Near Threatened based on the potential for future habitat loss and on a lack of information on population fragmentation. However, these threats are not plausible given that most of the area is not transformed, and the population is unlikely to be severely fragmented. Regardless, niche modelling suggests that the range may contract by more than 50% by the year 2070. Because this species is inferred to have a relatively short generation length, suspected population declines due to climate change over the three generations would not be large enough to qualify as threatened under criterion A.

Vhembelacerta rupicola, Louis Trichardt, Limpopo province (© R.I. Stander).

Family Lacertidae

Taxonomic notes: No taxonomic issues. *Other important names*: *Australolacerta rupicola*.

Distribution: This species occurs throughout the Soutpansberg, Limpopo province, South Africa (Jacobsen 1989; Branch 1998b). The west-central parts of the mountain appear to be more suitable (Petford et al. 2019), and the majority of records have been collected from there. *EOO*: 1 870 km^2; *Distribution*: 1 630 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on rocky outcrops, scree slopes and bedrock (Jacobsen 1989) in the cooler, wetter west-central areas of the Soutpansberg (Petford et al. 2019). There are a few records in the eastern Soutpansberg (Petford et al. 2019). *Habitat*: Grassland, Savanna.

Threats: The establishment of plantations was the main threat to the quality and extent of habitat. However, plantations are limited to the eastern margin of the distribution and covers a minority of the range. This species may be vulnerable to future climate change (Petford & Alexander 2021a). Based on a conservative climate change scenario, Petford and Alexander (2021a) predict a range reduction of at least half of the current range by the year 2070, and this could be an emerging threat.

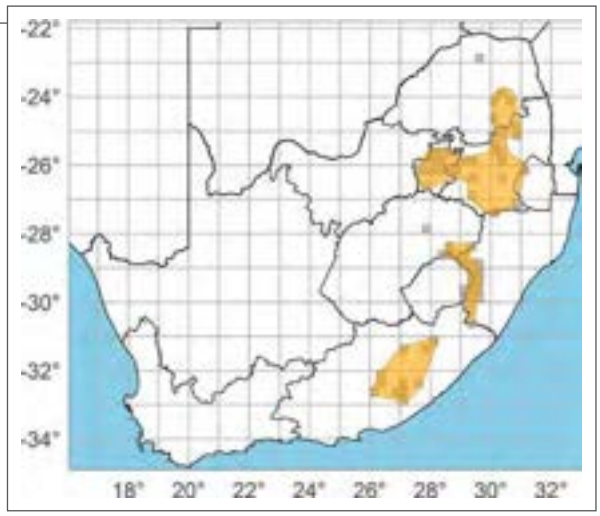
Population trend: Possibly in decline due to current and predicted climate change, which is likely to be causing a decrease in range size and an increase in population fragmentation at present. Niche modelling suggests there could be a 50% decline in the climatically suitable area (Petford & Alexander 2021a,b). However, it is unknown whether the niche modelling can be directly translated to a decline in habitat extent, so this appraisal must be treated with caution.

Conservation and research recommendations: The species was poorly protected (Tolley et al. 2019a), but a newly declared national protected area in the Soutpansberg (Western Soutpansberg Nature Reserve; Limpopo Provincial Notice 159 of 2021, 3 December 2021, No. 3220) puts several thousand hectares of the range under protection. Surveys are needed to assess population trends, and to collect information to improve delineation of the distribution in the east. An evaluation as to whether plantations have impacted the species would facilitate future assessments.

Family **Cordylidae**

Chamaesaura aenea (Fitzinger, 1843)

Coppery Grass Lizard



Regional endemic

NT – Near Threatened A3c (Global)

Assessors: Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J., Bates, M.F., Tolley, K.A.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Although the Grassland biome where this species occurs has undergone substantial losses in extent and quality of habitat, this lizard has a widespread distribution that should mitigate the local threats of habitat loss to some degree. Previously assessed as Near Threatened (A2c) in 2017 based on a 20% population reduction as a result of habitat loss causing a decline in AOO and EOO. However, the concept of AOO was incorrectly applied in that assessment, and the EOO cannot be considered in decline as some new records have been made in each of the subpopulations, although these new records are from small patches of intact Grassland. Examination of the most recent land cover clearly shows the habitat quality and extent have undergone a large decline and that most of the Grassland habitat is lost or heavily fragmented, and this habitat loss is ongoing. Although it is unlikely that there would be a population reduction of more than 30% within the next three generations (i.e., 18–24 years), the future habitat loss might be great enough to result in a significant population reduction.

Chamaesaura aenea, Makobulaan Nature Reserve, Mpumalanga province (© D.W. Pietersen).

Family **Cordylidae**

Chamaesaura aenea, Mpumalanga province (© A. Jordaan).

Taxonomic notes: The relationship between the potentially isolated subpopulations should be investigated in a phylogenetic framework. *Other important names*: none.

Distribution: Occurs across western Eswatini and most of northeastern South Africa. Common along the lower slopes of the Drakensberg with several additional scattered records outside the main distribution, suggesting the species could be more widespread. Although this lizard is thought to occur in isolated subpopulations, this perception may, to some degree, be the result of uneven sampling. *EOO*: 292 000 km²; *Distribution*: 98 900 km².

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Grassy slopes and plateau regions at high elevation from 1 400 to 2 300 m a.s.l. (Jacobsen 1989; Branch 1998; Bourquin 2004). *Habitat*: Grassland.

Threats: The Grassland biome has undergone substantial transformation due to habitat fragmentation as a result of modified burning regimes, crop farming, afforestation, overgrazing by livestock, infrastructural development (including extreme urbanisation in Gauteng province) and use of pesticides. Nearly 40% of the Grassland biome has been transformed (Skowno et al. 2019). However, this species' distribution is large, so these threats are not considered a substantial threat to the species as a whole, and the species is well protected (Tolley et al. 2019a). Despite this, it appears to have been severely reduced in abundance and extent in Gauteng and large parts of Mpumalanga provinces where it has rarely been recorded over the last few decades (Whittington-Jones et al. 2008).

Population trend: There are several recent records from the Drakensberg region where much Grassland habitat remains. In contrast, intensive surveys throughout Gauteng province in the period 2000–2008 recorded only two specimens, both from Rietvlei Nature Reserve (Whittington-Jones et al. 2008). In other areas of the range, there have been no new records in decades, possibly indicating local population declines. The areas where new records are lacking correspond to the parts of the range where habitat loss has been the most severe. Despite this, the population is not considered severely fragmented as it is suspected that more than 50% of the individuals occur in viable subpopulations such as the areas within the Drakensberg region.

Conservation and research recommendations: Improved data on abundance in areas that are impacted will be useful to assess whether the species is undergoing declines due to impacts on the Grassland habitat. The areas between the three subpopulations are poorly surveyed for reptiles, and improved data could allow for an assessment regarding the connectivity of subpopulations, in particular the highveld populations where few observations have been made despite targeted surveys. The population decline relative to the past extent of habitat loss requires quantification.

Family **Cordylidae**

Chamaesaura anguina (Linnaeus, 1758)

Cape Grass Lizard

LC – Least Concern (Regional)

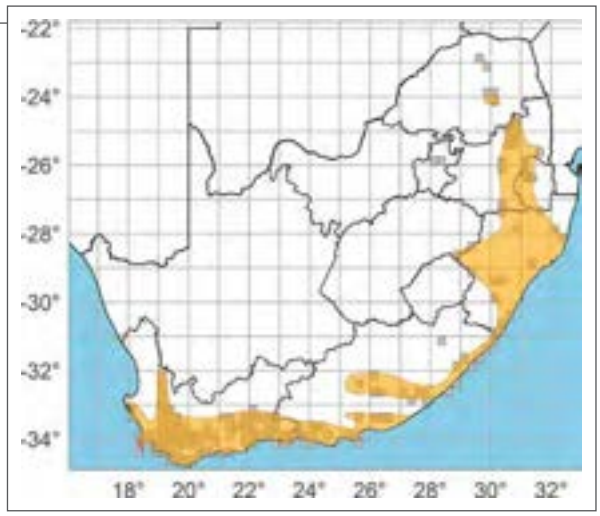
Assessors: Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J., Bates, M.F., Tolley, K.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Chamaesaura anguina anguina* – Least Concern (SARCA).

Assessment rationale: This species has a very large distribution in South Africa and although much of the range has been transformed by agriculture and urbanisation, substantial portions of its habitat are still intact. Most of the habitat transformation occurred prior to 1990 with relatively little additional transformation since that time. Of particular concern is the Gauteng province population, which has not been recorded as present in the last several decades.

Taxonomic notes: The relationship between the two geographically separated subspecies, *C. anguina anguina* (South Africa and Eswatini) and *C. anguina oligopholis* (Angola and Democratic Republic of the Congo) has not been assessed. *Other important names*: none.



Distribution: This species occurs in two main subpopulations, one in central Africa and the other in southern Africa. The latter subpopulation is endemic to the region, where it extends along the escarpment and continental margin from Limpopo province southwards into the Western Cape province (Jacobsen 1989; Branch 1998). The range of the southern subpopulation is fragmented and is apparently restricted to mesic Grasslands in the north and central parts of the range and Fynbos in the south. *EOO*: 918 000 km^2; *Distribution*: 198 000 km^2.

Countries of occurrence: Angola, Democratic Republic of the Congo, Eswatini, South Africa.

Chamaesaura anguina anguina, Limietberg, Western Cape province (© L. Kemp).

Family **Cordylidae**

Chamaesaura anguina anguina, Swaershoek Pass, Eastern Cape province (© L. Kemp).

Habitat and ecology: It uses diverse habitats across its range, although much of the range is within mountainous areas, from sea level up to 1 800 m a.s.l. (Jacobsen 1989; Bourquin 2004). Uses restios and grasses for both resting upon and swimming over (Branch 1998; Du Toit et al. 2003). Takes shelter at the base of restio or grass tufts and does not shelter in rock crevices or rodent burrows, even during fires (Du Preez 2007). *Habitat*: Grassland, Shrubland.

Threats: As much as 17% of the Fynbos biome and almost 40% of the Grassland biome, the main habitats in which this species occurs in South Africa, have been transformed or degraded (Skowno et al. 2019). However, most of this transformation occurred prior to 1990 with relatively little transformation during the last 25 years (see Geo Terra Image 2015, 2016; Skowno et al. 2019). This habitat loss may pose a significant threat in the more severely impacted parts of the range such as within Gauteng province, where the Grassland is highly fragmented, and this has probably resulted in local extinctions. This species has not been recorded from Gauteng province since the 1960s, despite herpetological surveys in the Grassland biome (see Whittington-Jones et al. 2008).

Population trend: The wide range of this species mitigates against the negative effects of local declines such as that observed for Gauteng province. The population is therefore inferred to be stable at present, although it most likely declined in the past due to the loss of Grassland habitat in parts of the range. These losses have probably caused a decline in EOO from the original extent.

Conservation and research recommendations: Investigation into the taxonomic status of the two subspecies (*C. a. anguina* and *C. a. oligopholis*) should be carried out. Surveys in Grassland habitat fragments are needed to assess the presence or absence of this species, particularly in the northern areas (e.g., Gauteng province) where Grassland has been reduced in extent.

Family **Cordylidae**

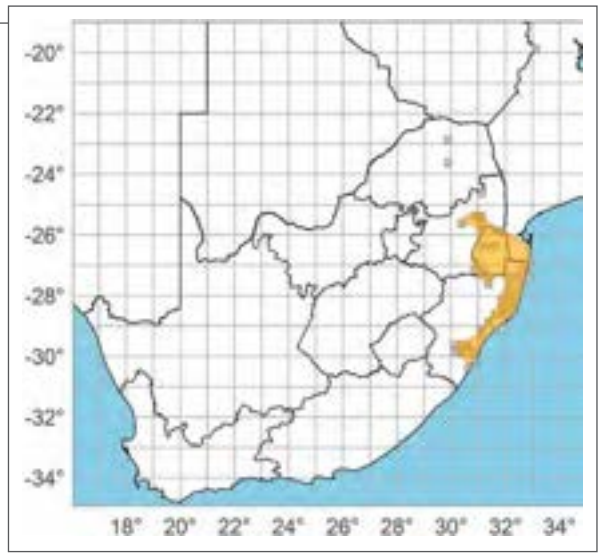
Chamaesaura macrolepis (Cope, 1862)

Large-scaled Grass Lizard

Regional near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Although the Grassland biome in which this species occurs has undergone substantial reduction in extent and quality, the overall range is very large, which mitigates against extinction risk. This species was previously assessed as Near Threatened in 2014 due to a population reduction of 20% over the last three generations. However, most of the habitat loss that relates to this potential population decline occurred prior to 1990. Approximately 43% of the habitat has been lost in total, of which 5% has been lost since 1990. Although the recent loss in habitat is significant, this is far below the threshold required to qualify as threatened due to an associated population decline under criterion A.

Taxonomic notes: A phylogenetic analysis would be helpful to assess the taxonomic status of the isolated subpopulation of *C. macrolepis* in the eastern highlands of Zimbabwe. *Other important names*: none.

Distribution: Occurs across most of northeastern South Africa, ranging into Eswatini and Zimbabwe. Records in Limpopo and western Mpumalanga provinces may represent allopatric subpopulations, and the isolated subpopulation in Zimbabwe is restricted to the Chimanimani Mountains (Broadley 1966a). There are potentially several isolated subpopulations in Limpopo province, although these are each represented by single records that are 20 years old or more, with no additional verified records since. There is a historical record (unknown collection date) from the Soutpansberg (see

Chamaesaura macrolepis, Cape Vidal, KwaZulu-Natal province (© G. Alexander).

Family **Cordylidae**

Chamaesaura macrolepis, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Jacobsen 1989) that is considered valid, although the species has not been observed there again. Recently recorded for the first time from southern Mozambique (Jordaan 2020). Given it occurs in the Chimanimani Mountains of Zimbabwe, it might also occur across the border in the Mozambican section of those mountains. A western Mpumalanga province record from Clewer (Bates 2014b), should be assigned to *C. aenea* (Jacobsen 1989). *EOO*: 199 150 km^2; *Distribution*: 58 100 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Occurs in grassy vegetation across the range, from sea level to 900 m a.s.l. (Bruton & Haacke 1980; Jacobsen 1989; Branch 1998; Bourquin 2004). *Habitat*: Grassland, Savanna.

Threats: The habitat of this species has been heavily transformed by crop farming and plantations, overgrazing by livestock, infrastructural development, frequent anthropogenic fires and the use of pesticides. Nearly 40% of the Grassland biome, in which most of its range is located, has been degraded or converted into cropland or forestry plantations (Skowno et al. 2019), and an estimated 43% of this species' distribution has been impacted. Large parts of its habitat have been afforested and much of the remaining area is burnt once or twice a year (Jacobsen 1989). Frequent fires and fragmentation of habitat might reduce the possibility for the re-establishment of populations.

Population trend: The wide range and abundance of this species should mitigate against the negative effects of local population declines due to habitat transformation.

Conservation and research recommendations: More comprehensive information on the distribution, as well as the status of its habitat, would aid the assessment of how habitat conversion is affecting this species.

Family **Cordylidae**

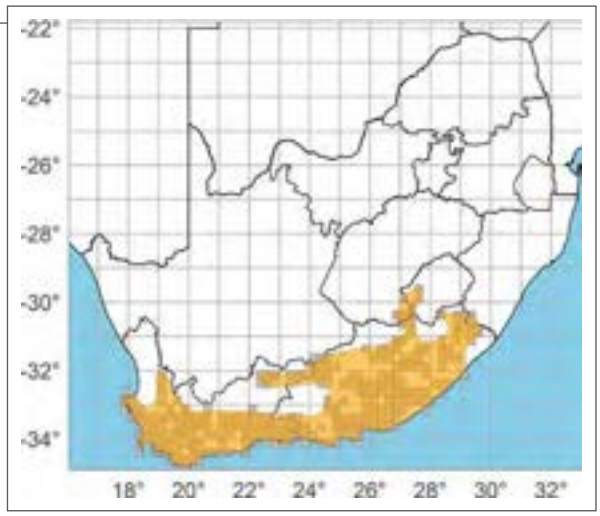
Cordylus cordylus (Linnaeus, 1758)

Cape Girdled Lizard

Regional endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: A phylogenetic analysis revealed that *C. tasmani* is paraphyletic with *C. cordylus* and it is therefore treated as a junior synonym of *C. cordylus* (Stanley et al. 2011). Although a phylogeographic study showed there are two clades (southwestern Cape and another covering the rest of the distribution), the divergence between these clades is not at the species level (Diedericks et al. 2013). There are no other outstanding taxonomic issues. *Other important names*: *Cordylus tasmani*.

Distribution: Distributed across most of southern South Africa, from the southwest coastal regions through the Cape Fold Mountains and the Great Escarpment, to the eastern coastal regions, extending marginally into southwestern Lesotho (De Waal 1978; Bates 2007a). Also occurs on St Croix Island off the southeast coast near Gqeberha (as *C. tasmani* Branch, 1998). *EOO*: 382 000 km^2; *Distribution*: 209 000 km^2.

Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: Rupicolous, occurring in diverse habitats from coastal rocky areas to mountain tops, where they typically occupy cracks in limestone and sandstone outcrops. It can be abundant on mountain plateaus in Fynbos or along shale bands in mesic Thicket (Branch 1998). Individuals (under the name *C. tasmani*) have been found sheltering under the apron of dead leaves on tall aloes, under the bark

Cordylus cordylus, Karoo National Park, Western Cape province (© W. Conradie).

Family **Cordylidae**

Cordylus cordylus, Welbedacht Nature Reserve, Eastern Cape province (© W. Conradie).

of trees, on dead aloe stems and in piles of rotting *spekboom* (*Portulacaria afra*) trunks (Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no major threats to this species. *Use and trade*: This species is listed in CITES Appendix II and was most recently recorded as exported from South Africa for the pet trade in the 1990s in small numbers (UNEP-WCMC 2020). Significant numbers of wild-caught individuals (in the thousands) were reportedly exported from Tanzania to the USA, Europe and Japan in the 1990s but there are no similar recent exports. Those earlier exports are unusual because Tanzania is not within this species' distribution and these records could represent exports of a different *Cordylus* species (e.g., *C. tropidosternum* or *C. beraduccii*) from Tanzania exported under the name *Cordylus cordylus*.

Population trend: Although there has been habitat loss in some areas, the large geographic range and abundance of this lizard mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Family **Cordylidae**

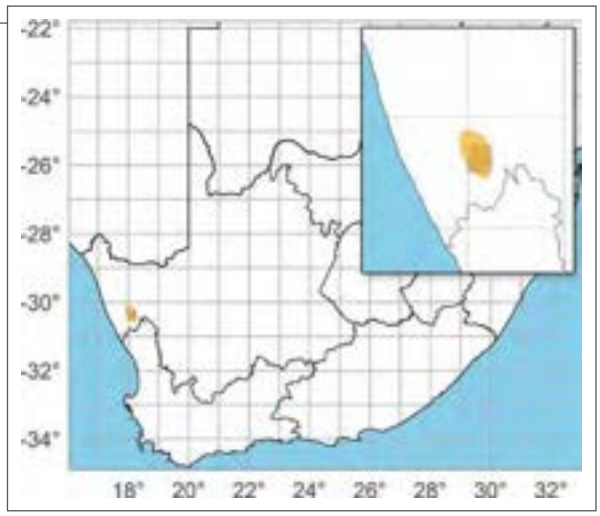
Cordylus imkeae Mouton & Van Wyk, 1994

Rooiberg Girdled Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Tolley, K.A., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment.)
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Although this taxon has a small range, it occurs in a remote area where the habitat is not notably impacted by transformation. Assessed as Near Threatened in 2017, the species was cited as not experiencing any significant or plausible threats, aside from over-collection. Despite this assertion, exports for commercial trade purposes have not been recorded under CITES, although there have been a limited number of exports for scientific purposes. Nevertheless, collection from the wild appears to be extremely limited and is not a significant threat.

Taxonomic notes: The taxonomic status of forms in the *C. minor* species complex (Mouton & Van Wyk 1994), to which *C. imkeae* belongs, were evaluated in a phylogenetic framework, and this species is considered valid (Tolley et al. 2022). There have not been any taxonomic issues with *C. imkeae* noted to date. *Other important names*: none.

Distribution: Endemic to the Rooiberg in the Kamiesberg range near Garies in Namaqualand, Northern Cape province, South Africa (Mouton & Van Wyk 1994). *EOO*: 1 030 km^2; *Distribution*: 1 030 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Rock-dwelling, sheltering in crevices in granite outcrops in high Fynbos-covered mountain slopes (Mouton & Van Wyk 1994). The Fynbos habitat in the mountains where this lizard occurs is disjunct with the Fynbos biome, suggesting that this species has been isolated for some time from

Cordylus imkeae, Rooiberg, Northern Cape province (© C. & S. Dorse).

Family **Cordylidae**

Cordylus imkeae, Rooiberg, Northern Cape province (© M. Burger).

its sister species in the *C. minor* complex. *Habitat*: Shrubland.

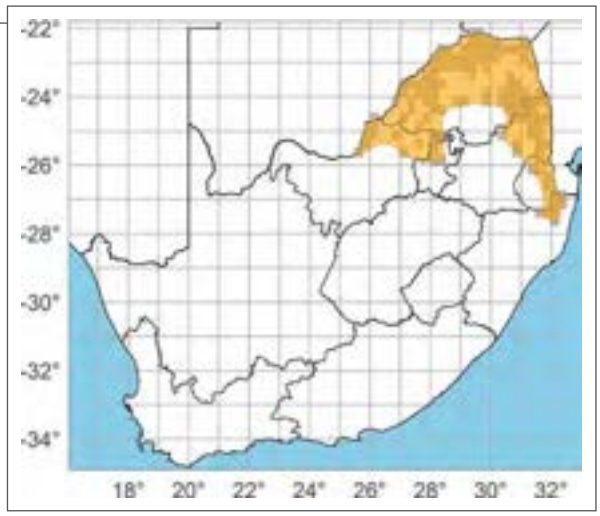
Threats: There are no immediate plausible threats. Regardless, given its small range, the predicted negative effects of climate change in this region (Engelbrecht et al. 2015) may be an emerging threat. *Use and trade*: This species is listed in CITES Appendix II, but only 11 live individuals have been exported for scientific purposes under permit from the wild since 2006, with none prior to that time. No permitted exports for the pet trade are on record (UNEP-WCMC 2020), so trade is unlikely to be a threat to this species. It is possible that the live individuals exported for scientific purposes are being captive bred in Europe (see photos in Reissig 2014).

Population trend: The species is not considered to be in decline given that the area in which it occurs is not under threat from habitat transformation.

Conservation and research recommendations: It is not known to occur in any protected areas (Tolley et al. 2019a) and the distribution overall is poorly defined. There are very few records of this lizard, but it occurs in an area that is undersampled (see Tolley et al. 2022a). Field surveys should be conducted in wider areas near to the only known locality to provide a better estimate of range size and to better assess potential threats.

Cordylus jonesii (Boulenger, 1891)

Jones' Girdled Lizard



LC – Least Concern (Regional)

Assessors: Bates, M.F., Mouton, P.L.F.N.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread and common with no known major threats.

Taxonomic notes: No taxonomic issues. *Other important names*: *Cordylus tropidosternum jonesii*.

Distribution: Widespread across the eastern parts of southern Africa, extending from southern Mozambique, westwards as far as eastern Botswana. Regionally, it occurs in the northeast from northern Limpopo province southwards through Eswatini to northern KwaZulu-Natal province, and westwards as far as North West province, South Africa (Branch 1998). *EOO*: 269 000 km²; *Distribution*: 162 000 km².

Countries of occurrence: Botswana, Eswatini, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Largely restricted to mesic, Lowveld habitat, particularly Mopane (*Colophospermum mopane*) Savanna (Branch 1998), where it shelters in holes in trees, under loose bark and especially in rotting logs, but occasionally also found in rock crevices (Jacobsen 1989). *Habitat*: Savanna.

Threats: There is some habitat transformation in the southern portion of the distribution around Gauteng and southern Limpopo provinces.

Population trend: The population size is assumed to be stable because this is a widespread and common species, and the extent of habitat transformation is small in relation to its large range.

Conservation and research recommendations: No recommendations.

Cordylus jonesii, Skukuza, Kruger National Park (© G. Alexander).

Cordylus jonesii, Blouberg, Limpopo province (© L. Verburgt).

Family **Cordylidae**

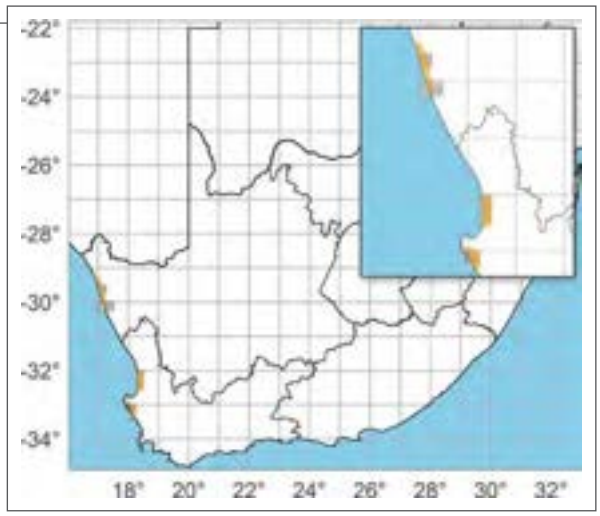
Cordylus macropholis (Boulenger, 1910)

Large-scaled Girdled Lizard

South African endemic

NT – Near Threatened B1b(iii) (Global)

Assessors: Tolley, K.A., Weeber, J., Conradie, W., Pietersen, D.W., Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Genuine.

Assessment rationale: Although there has been some loss of habitat quality and extent, this primarily occurred prior to 1990 and mostly within the northernmost and southernmost subpopulations. Most of the habitat within its distribution remains untransformed and the species is well protected. Assessed in 2017 as Near Threatened, this was based on a continuing decline in habitat quality and extent due to coastal development and mining. However, the national land cover spatial data did not support that earlier assertion. Although 23% of the range had been affected in total, the continuing declines were not significant (~3% lost since 1990). Nevertheless, an increase in mining is now a plausible threat, as several new coastal strip-mining applications are in progress and the proposed footprint has considerable overlap with this species' range. While the latitudinal spread of the distribution is extensive, the range only extends about 15 km inland. Thus, land transformation from coastal mining could destroy large tracts of habitat within the range and cause population fragmentation within subpopulations.

Taxonomic notes: There is a large geographic gap between each of the three subpopulations, particularly

Cordylus macropholis, Koingnaas, Northern Cape province (© L. Kemp).

for the northernmost subpopulation. The degree of differentiation between these subpopulations has not been assessed. *Other important names*: none.

Distribution: Occurs as three subpopulations along the west coast of South Africa, from Port Nolloth (Northern Cape province) southwards to Yzerfontein (Western Cape province). There is a 250 km gap between the northern and central subpopulations, and a 50 km gap between the southern and central subpopulations, with the distribution extending up to about 15 km inland for all subpopulations. *EOO*: 21 940 km^2; *Distribution*: 2 720 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species uses the succulent plant *Euphorbia caput-medusae* and similar species as shelter and is thought to be abundant in areas where *E. caput-medusae* plants are common (Mouton et al. 2000). Individuals also shelter beneath calcrete rocks and in nests of *Otomys* rats (P.L.F.N. Mouton, pers. obs.). *Habitat*: Shrubland.

Threats: This species was previously under threat from coastal development although the majority of that habitat transformation occurred prior to 1990 (see Geo Terra Image 2015, 2016; Skowno et al. 2019). A small proportion of the habitat of the northern subpopulation has been impacted by mining. Approximately half of the habitat within the two southern subpopulations has been impacted by agriculture and, to a lesser extent, by coastal urban development. There have been several new strip-mining applications that are in various stages of approval, which could heavily impact the coastal margin and inland, especially for the central sub-population. The potential mining footprint overlaps significantly with the range of this species and therefore mining could be a significant plausible emerging threat. *Use and trade*: This species is listed on CITES Appendix II but has not been legally exported from South Africa for the pet trade (UNEP-WCMC 2020). There were, however, limited exports for scientific purposes (14 individuals since 1988), but this is not expected to pose any risk for the species. Twenty-five individuals are recorded as exported from Mozambique, but the species does not occur there and this likely represents exports of a different cordylid species, or potentially the laundering of individuals through other countries.

Cordylus macropholis, Lambert's Bay, Western Cape province (© C. Keates).

Population trend: Not considered to be in decline, as habitat loss in the area over the last decades has been minimal. The species may have undergone a historical decline due to land development prior to 1990.

Conservation and research recommendations: Additional surveys followed up by an investigation of the taxonomic status of the three subpopulations is required to assess whether these represent distinct taxa. Research on the extent of emerging pressures is needed to assess population trends, i.e., the expanding mining footprint should be monitored to assess further declines in habitat quality and extent.

Family **Cordylidae**

Cordylus mclachlani Mouton, 1986

McLachlan's Girdled Lizard

South African endemic

LC – Least Concern (Global)

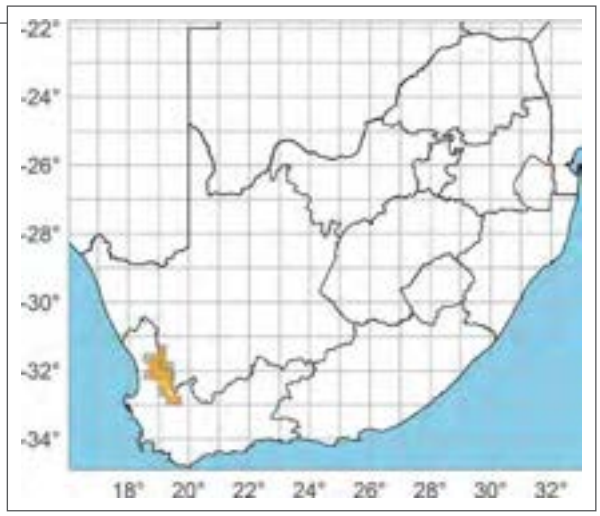
Assessors: Bates, M.F., Tolley, K.A., Mouton, P.L.F.N.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Vulnerable (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Assessment rationale: This species has a moderate EOO and the habitat in which it occurs is not under major threat from land use change.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs across the greater Cederberg in the Western and Northern Cape provinces of South Africa, from the Koue Bokkeveld in the south, along the eastern fringes of the Cederberg to the Bokkeveld Mountains in the north (Mouton et al. 1992). *EOO*: 9 350 km²; *Distribution*: 7 780 km².



Country of occurrence: South Africa.

Habitat and ecology: A rupicolous species that uses narrow cracks in low rock formations in mountainous areas within Karroid Vegetation and Fynbos habitat (Mouton 1986; Mouton et al. 1992). *Habitat*: Shrubland.

Threats: Occurs in mountainous terrain where there are no tangible threats. *Use and trade*: This species is listed in CITES Appendix II, and there have been a number of exports from Colombia and Guyana listed as 'captive bred' for trade during the 1990s. However, there were no original CITES exports registered from South Africa to countries where the captive bred exports originated (UNEP-WCMC 2020). Therefore, the legality of these supposed captive bred individuals is in question given that the species is endemic to South Africa. Regardless, no exports for trade have been made in recent years under CITES, so it is unlikely that trade is impacting this species.

Population trend: The population size is thought to be stable as the mountainous and rupicolous habitat of this species has not been impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Cordylus mclachlani, Gifberg, Western Cape province (© M. Burger).

Family **Cordylidae**

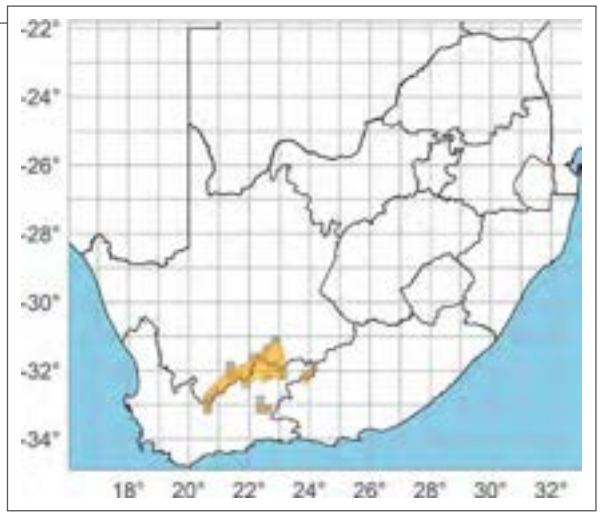
Cordylus minor FitzSimons, 1943

Dwarf Girdled Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This lizard is widespread in a region where there is little habitat transformation. There are no significant threats and the population is considered to be stable.

Taxonomic notes: *Cordylus aridus* and *C. cloetei* have been synonymised with *C. minor* (Tolley et al. 2022a). *Other important names*: *Cordylus aridus*; *Cordylus cloetei*.

Distribution: Occurs from the low-lying south-central Karoo region extending into the Great Karoo along the Great Escarpment from the southern Roggeveld (southwestern Karoo) and Nuweveld Mountains, eastwards along the Great Escarpment into the Eastern Cape province and extending northwards into the Great Karoo. Current records suggest there might be some gaps in the distribution, but this perception could be the result of poor survey efforts. *EOO*: 49 570 km^2; *Distribution*: 18 885 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Shelters in narrow rock cracks in rocky terrain, rock outcrops and in mountainous areas (Branch 1998). *Habitat*: Shrubland.

Threats: There are no significant threats. *Use and trade*: This species is listed in CITES under Appendix II, but there is no recorded trade (UNEP-WCMC 2020).

Population trend: The population size is considered stable as the rupicolous habitat of this species has not been impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Cordylus minor, Farm De Hoek, Nuweveldberg, Western Cape province (© W.R. Branch).

Cordylus minor, Matjiesfontein, Western Cape province (© W. Conradie).

Family **Cordylidae**

Cordylus niger Cuvier, 1829

Black Girdled Lizard

South African endemic

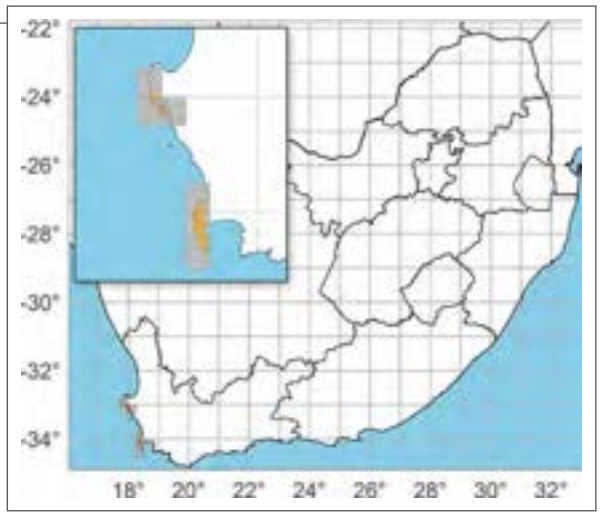
LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Although parts of the range have been impacted by loss in extent and quality of habitat, these pressures have slowed, the range is not severely fragmented, and the species is well protected (Tolley et al. 2019a). These lizards appear to cope with low-level habitat modification, as long as this is adjacent to natural areas. Previously assessed as Near Threatened in 2017 based on a decline in habitat quality. However, most of the range occurs in protected areas where there has been little decline in habitat quality.



Taxonomic notes: A phylogenetic analysis (Daniels et al. 2004) suggests that there is cryptic diversity, possibly at the species level, within *C. niger*. *Other important names*: none.

Distribution: Restricted to the extreme southwestern coastal region of the Western Cape province, South Africa, occurring in five isolated subpopulations, two at Saldanha, one each on the Langebaan Peninsula and Jutten Island, and the main subpopulation on

Cordylus niger, Table Mountain, Western Cape province (© G. Alexander).

Cordylus niger, Silvermine, Western Cape province (© L. Kemp).

the Cape Peninsula (Cordes & Mouton 1996). *EOO*: 2 480 km^2; *Distribution*: 456 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in dense colonies in rocky areas from sea level to mountain tops (Cordes & Mouton 1996). *Habitat*: Shrubland.

Threats: A minor proportion of the range has been transformed by urban development, but this threat has not increased substantially in the last decades. The high prevalence of domestic cats (*Felis catus*) in suburban areas adjoining suitable mountainous habitat takes a toll on these lizards (Seymour et al. 2020). While the largest portion of the range is within protected areas where habitat is still considered pristine, it should be noted that suppression of the natural fire regime in these areas may result in bush encroachment, and this has been known to negatively affect other species that only occur in these protected areas (Cressey et al. 2015). *Use and trade*: This species is listed in CITES Appendix II but has not been exported for the pet trade under CITES (UNEP-WCMC 2020).

Population trend: This lizard is locally abundant and there is a low level of habitat transformation throughout the distribution. Although predation by domestic cats has been documented (Seymour et al. 2020), this currently affects a small proportion of the population and is unlikely to contribute to any significant declines. Overall, the population is suspected to be stable.

Conservation and research recommendations: No recommendations.

Family **Cordylidae**

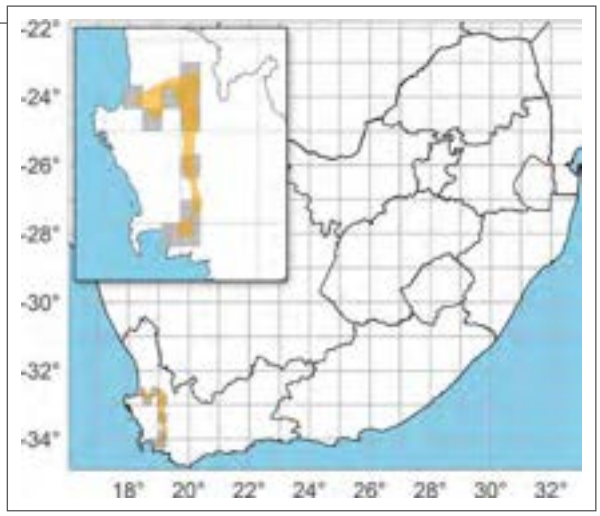
Cordylus oelofseni Mouton & van Wyk, 1990

Oelofsen's Girdled Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Although this species has a small distribution and has experienced some decline in habitat quality, the habitat is not severely fragmented and there are no major threats. Assessed in 2017 as Near Threatened due to poor fire management and alien plants. Nevertheless, most of the habitat within the range is intact and in a relatively pristine state.

Taxonomic notes: The populations occurring at Dasklip Pass, Landdroskop and Piketberg appear to be genetically distinct at the species level (Daniels et al. 2004; Stanley et al. 2011) and merit further investigation. *Other important names*: none.

Distribution: Occurs along the western Cape Fold Mountains, Western Cape province, South Africa, from Piketberg and Piekenierskloof Pass in the north to the Hottentots Holland Mountains in the south. *EOO*: 8 950 km^2; *Distribution*: 2 810 km^2.

Country of occurrence: South Africa.

Cordylus oelofseni, Porterville, Western Cape province (© C. & S. Dorse).

Cordylus oelofseni, Mont Rochelle, Western Cape province (© R. van Huyssteen).

Habitat and ecology: A rock-dwelling species that shelters in narrow cracks in small sandstone outcrops at elevations above 300 m a.s.l. (Mouton & Van Wyk 1990; Janse van Rensburg et al. 2009). Occurs in aggregations on mountain plateaus (P.L.F.N. Mouton, pers. obs.). *Habitat*: Shrubland.

Threats: Minor threats include alien plant infestation and issues around fire suppression for the Fynbos vegetation, which might cause an overgrowth of plants around sheltering and foraging sites. *Use and trade*: This species is listed in CITES Appendix II but has not been exported for the pet trade under CITES (UNEP-WCMC 2020).

Population trend: This species is not considered to be in decline given that it is mainly restricted to higher elevations where there is little anthropogenic impact.

Conservation and research recommendations: Control of alien plant infestations and effective fire management are recommended. Taxonomic studies are required to assess the status of the isolated sub-populations.

Family **Cordylidae**

Cordylus vittifer (Reichenow, 1887)

Common Girdled Lizard

Regional near-endemic

LC – Least Concern (Global)

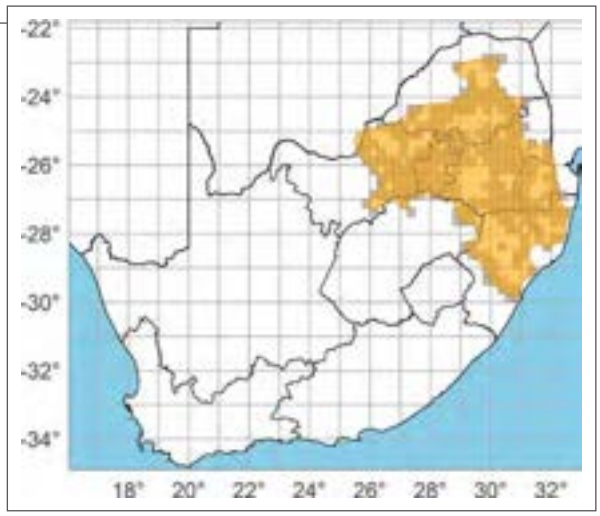
Assessors: Bates, M.F., Mouton, P.L.F.N.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread and common with no major threats.

Taxonomic notes: There is genetic and morphological structure within *C. vittifer* that could represent at least three species (De Waal 1978; Stanley et al. 2011). *Other important names*: none.

Distribution: Widespread in the northeastern parts of South Africa, Eswatini, southeastern Botswana (Auerbach 1987) and southern Mozambique in the Lebombo Mountains (Bates & Broadley 2012). *EOO*: 350 000 km²; *Distribution*: 264 000 km².



Countries of occurrence: Botswana, Eswatini, Mozambique, South Africa.

Habitat and ecology: Occurs on rock outcrops and isolated boulders or rocks in Grasslands and Mesic Woodlands (De Waal 1978; Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: There are no major threats to this species, although exportation of wild-caught animals for the pet trade may pose a threat locally. *Use and trade*: This species is listed in CITES Appendix II and wild-caught individuals are regularly exported from South Africa for the pet trade, most recently in 2015 (UNEP-WCMC 2020). Overall, more than 7 000 individuals were removed from the wild in South Africa from 1982 to 2015. In the last decade alone, this figure totals ± 2 000 individuals. There was also a recent

Cordylus vittifer, Magaliesberg, Gauteng province (© L. Kemp).

Cordylus vittifer, Songimvelo Nature Reserve, Mpumalanga province (© L. Kemp).

Cordylus vittifer, Buffelskloof Private Nature Reserve, Mpumalanga province (© L. Verburgt).

(2017) export of 64 wild-caught individuals from Namibia to South Africa for scientific purposes (UNEP-WCMC 2020), despite Namibia not being within the species' range. The latter individuals may have been of a similar species, *C. machadoi*, which occurs in northern Namibia and southwestern Angola.

Population trend: This is a widespread and abundant species. Although it is likely that the population has declined to an extent given that there is some habitat loss within the range, it is not likely that these declines pose a significant threat to the species.

Conservation and research recommendations: Considering that there is a fair number of removals from the wild for the pet trade, it would be useful to explore the source and location of these to ensure that targeted removals are not detrimental to populations locally. The taxonomic status of the different forms of *C. vittifer* requires assessment.

Family **Cordylidae**

Hemicordylus capensis (Smith, 1838)

Graceful Crag Lizard

South African endemic

LC – Least Concern (Global)

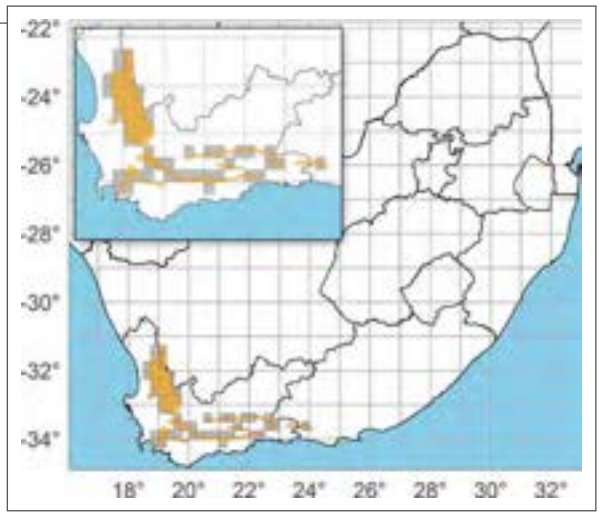
Assessor: Bates, M.F.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although many subpopulations are small and occur as montane isolates, the species is overall widespread and common with no major threats.

Taxonomic notes: Loveridge (1944) recognised two species, *Pseudocordylus [Hemicordylus] capensis* and *P. [H.] robertsi* (Van Dam, 1921) based on morphological differences, while Branch (1981) treated these as subspecies of *P. [H.] capensis*. The subspecies are no longer considered valid (Herselman et al. 1992). A subsequent phylogenetic analysis suggested that there are multiple divergent clades within *H. capensis* that may represent cryptic species (Mabe 2009). *Other important names*: *Pseudocordylus capensis*; *Cordylus capensis*.

Distribution: This species occurs across the Cape Fold Mountains of South Africa, extending into the arid escarpment region north of the Cederberg range. In the southern Cape Fold Mountains, it is restricted to high elevations on the mountains, resulting in the geographic isolation of several subpopulations (Herselman et al. 1992). In the northern Cape Fold Mountains and the escarpment regions, the distribution is more continuous and includes smaller mountains, rocky outcrops and cliffs (Herselman 1991). *EOO*: 91 000 km²; *Distribution*: 18 200 km².



Country of occurrence: South Africa.

Habitat and ecology: Occurs on cliffs and boulders at the tops of mountains and on rocky outcrops where they characteristically perch on vertical rock faces and take shelter in rock cracks (FitzSimons 1943; Branch 1998). The elevational range is low in the north of the distribution (360–455 m a.s.l.; Herselman 1991), but the isolated subpopulations in the southern Cape Fold Mountains occur higher, often on the mountain peaks (up to 2 200 m a.s.l.; K.A. Tolley, pers. comm. 2020). *Habitat*: Shrubland.

Threats: There are no major threats to this widespread and relatively abundant species. *Use and trade*: This species is listed in CITES Appendix II but has never been exported from South Africa for trade under CITES (UNEP-WCMC 2020).

Population trend: This species is widespread and locally abundant, with essentially no habitat transformation at the higher elevations or the northern arid regions where it occurs. The population is therefore considered to be stable.

Conservation and research recommendations: No recommendations.

Hemicordylus capensis, Vanrhyns Pass, Western Cape province (© W. Conradie).

Family **Cordylidae**

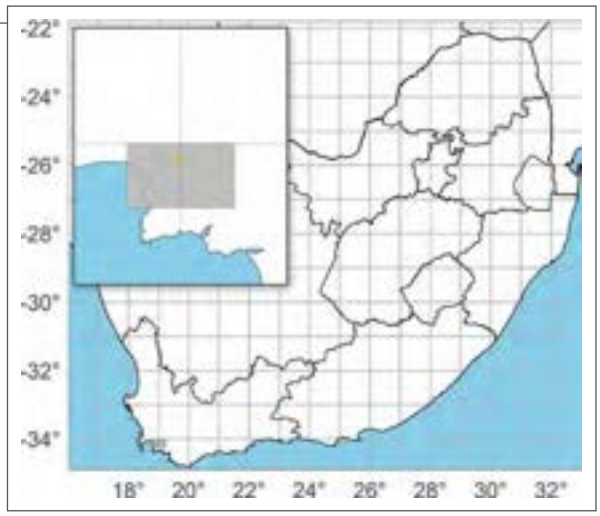
Hemicordylus nebulosus (Mouton & van Wyk, 1995)

Dwarf Crag Lizard

South African endemic

VU – Vulnerable D1 (Global)

Assessors: Tolley, K.A., Weeber, J., Alexander, G.J., Pietersen, D.W., Conradie, W., Bates, M.F.



Previous Red List categories:
2018: Vulnerable (Global IUCN Assessment).
2017: Vulnerable (Global IUCN Assessment).
2014: Vulnerable (SARCA).

Assessment rationale: This lizard has a very small range, but there are no immediate plausible threats within that range. It is suspected to occur as a small population, possibly with fewer than 1 000 individuals. Given this, it could be susceptible to stochastic events and is therefore assessed as Vulnerable.

Taxonomic notes: There are no taxonomic issues. However, because the distribution overlaps with the congener *H. capensis*, which is morphologically similar, there could be a number of misidentifications in the existing records. *Other important names*: *Pseudocordylus nebulosus*; *Cordylus nebulosus*.

Distribution: Endemic to the Hottentots Holland Mountains of the Western Cape province, South Africa, with a very restricted range. Recorded only at high elevations in the Landdroskop area in the Hottentots Holland Mountains, but it could be distributed further northeast into the higher, inaccessible mountains. The EOO estimate is a lower limit and could be as high as 70 km^2. *EOO*: 28–70 km^2; *AOO*: 28 km^2; *Distribution*: 12 km^2

Country of occurrence: South Africa.

Habitat and ecology: Rupicolous and occurring on vertical rock faces and piles of medium-sized boulders in the Fynbos biome at elevations of 1 200–1 500 m a.s.l. on mountain summits that are often shrouded in fog and mist (Costandius et al. 2006). *Habitat*: Shrubland.

Threats: Because this species occurs only at high elevations, there would be no possibility for upslope displacement should temperatures increase due to climate change. In addition, species found at lower

Hemicordylus nebulosus, Hottentots Holland Mountains, Western Cape province (© C. & S. Dorse).

Family Cordylidae

elevations could shift upslope and expand into areas currently occupied by *H. nebulosus,* which would increase competition for resources (Costandius et al. 2006). Issues around fire management may result in overgrowth of vegetation with a resultant reduction in basking sites (Costandius et al. 2006). Despite this, it occurs entirely within a protected area within a fairly remote and pristine habitat. *Use and trade*: This species is listed in CITES Appendix II but has not been exported for the pet trade under CITES (UNEP-WCMC 2020).

Population trend: Costandius et al. (2006) counted a total of 131 individuals in the Landdroskop area but given that the survey sites were spatially very localised and covered only a single field season, this type of census is only a minimum possible value for abundance and cannot be used to estimate population size. However, it is suspected that there are fewer than 1 000 individuals, which puts the species at risk from stochastic events. The population is not in decline or fragmented, given that the entire known range is within a protected area that is essentially pristine and does not receive many visitors.

Conservation and research recommendations: The entire known distribution of this species is limited to a single mountain within a protected area. Research focusing on the ability of this species to tolerate warmer temperatures might assist in assessing whether predicted climate change could have detrimental effects. This, coupled with a quantitative assessment of population size and survival rates, would allow for an appraisal of population trends. A fire management regime that minimises bush encroachment could also be beneficial.

Family **Cordylidae**

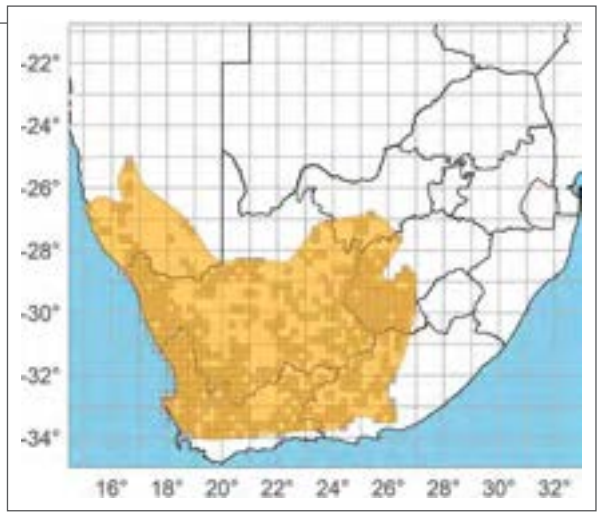
Karusasaurus polyzonus (Smith, 1838)

Karoo Girdled Lizard

Regional near-endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J., Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: The melanistic subpopulation in the Saldanha–Langebaan area was suspected to be a separate species (Mouton et al. 2002), but phylogenetic analyses do not support that assumption (Engelbrecht et al. 2011; Stanley et al. 2011). *Other important names*: *Cordylus polyzonus*.

Distribution: Widespread across most of western and central South Africa, extending northward into southwestern Namibia. Although it occurs in rocky habitats close to the intertidal zone along the west coast of South Africa, it does not similarly occur along the southern coast. Previous records from the Kalahari region (Mouton 2014) were georeferenced incorrectly and are therefore no longer included as part of the distribution. *EOO*: 843 200 km^2; *Distribution*: 646 600 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: This rupicolous lizard occurs across a wide range of habitats in the arid western

Karusasaurus polyzonus, Noup, Northern Cape province (© G. Alexander).

Family **Cordylidae**

Karusasaurus polyzonus, Rooipoort, Northern Cape province (© K.A. Tolley).

Karusasaurus polyzonus, Beaufort West, Western Cape province (© L. Verburgt).

and central karroid regions. It occurs on mountain slopes and rocky outcrops and on isolated boulders in otherwise flat landscapes. In the west, it occurs along the rocky coast close to the high tide line. In some areas it is common on dolerite rock outcrops on small hills (De Waal 1978). *Habitat*: Savanna, Shrubland.

Threats: There are no significant threats to this widespread and relatively abundant species. *Use and trade*: This species is listed on CITES Appendix II, but in the last decade, there have been very few exports (< 50 individuals) for the pet trade, and these were reported as being captive bred in origin (UNEP-WCMC 2020). Wild-caught individuals from South Africa exported for the pet trade number less than ten in total. There was one large export of 500 individuals in 1988 from Mozambique, but this likely represents exportation of a Mozambican species under the name *Cordylus* [=*Karusasaurus*] *polyzonus* because this species does not occur in Mozambique. Alternatively, this could represent cross-border smuggling out of South Africa before being exported from Mozambique.

Population trend: Although there has been some habitat loss within the distribution, the large geographic range and abundance of this lizard mitigate against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Family **Cordylidae**

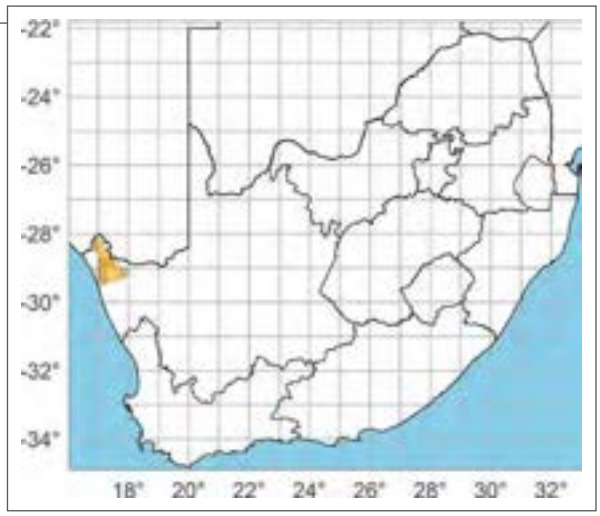
Namazonurus lawrenci (FitzSimons, 1939)

Lawrence's Girdled Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a moderate-sized range, occurs in an area where habitat transformation is minimal and a large portion of the range falls within a protected area.

Taxonomic notes: Previously included in the genus *Cordylus*, but with the erection of the genus *Namazonurus* (Stanley et al. 2011), there are no remaining taxonomic issues. *Other important names*: *Cordylus lawrenci*.

Distribution: Occurs in extreme northwestern South Africa in the Richtersveld region. There are records from near the border with Namibia, but it has not yet been recorded from within Namibia. *EOO*: 7 860 km^2; *Distribution*: 6 520 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A rock-dwelling lizard that occurs in an arid region, from mountain summits to a low elevation of 250 m a.s.l. (Branch 1998; Bauer & Branch 2003 [2001]). *Habitat*: Shrubland.

Threats: There are no major threats to this species given that it occurs in an area that is remote and largely intact. *Use and trade*: This species is listed in CITES Appendix II, but wild-caught individuals have never been exported from South Africa for the pet trade under CITES (UNEP-WCMC 2020). In the 1990s, 100 individuals were reportedly exported for trade from Tanzania, but this species does not occur there and thus the species being traded was likely misidentified or purposely misrepresented.

Population trend: Because this species occurs mainly in an arid region that has not been significantly impacted by habitat transformation and much of the range is in a protected area, the population size is not thought to have declined.

Conservation and research recommendations: There are relatively few records of this species, so field surveys might assist to provide improved information regarding distribution, particularly to determine whether it occurs in Namibia.

Namazonurus lawrenci, east of Port Nolloth, Northern Cape province (© D. Maguire).

Family **Cordylidae**

Namazonurus peersi (Hewitt, 1932)

Peers' Girdled Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.

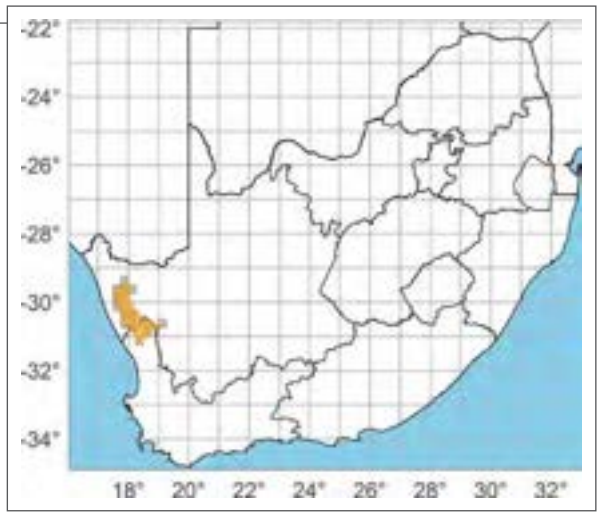
Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a moderate-sized range, is abundant and is well protected.

Taxonomic notes: Previously included in the genus *Cordylus*, but with the erection of the genus *Namazonurus* (Stanley et al. 2011), there are no remaining taxonomic issues. *Other important names*: *Cordylus peersi*.

Distribution: Occurs in the Namaqualand region in the northwestern parts of South Africa in the Northern and Western Cape provinces. *EOO*: 14 960 km^2; *Distribution*: 10 600 km^2.

Namazonurus peersi, Springbok, Northern Cape province (© W. Conradie).



Country of occurrence: South Africa.

Habitat and ecology: A rock-dwelling species that often shelters in small groups beneath thin rock flakes on the huge granite boulders typical of Namaqualand, in Succulent Karoo and Fynbos biomes (Branch 1998; Fell 2005). It appears to be restricted to the higher slopes of hills and mountains. *Habitat*: Shrubland.

Population trend: Because this species occurs mainly in an arid region that has not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Threats: There are no major threats to this species given that it occurs in an area that is relatively intact with much of the distribution within a protected area. *Use and trade*: This species is listed in CITES Appendix II, but only four wild-caught individuals have been exported from South Africa for the pet trade in 1992 (UNEP-WCMC 2020), so the pet trade is not considered a threat. In 1989, 100 individuals were reportedly exported for trade from Tanzania, but this species does not occur there and the actual species in trade was therefore likely misidentified or purposely misrepresented.

Conservation and research recommendations: No recommendations.

Family **Cordylidae**

Ninurta coeruleopunctatus (Hewitt & Methuen, 1913)

Blue-spotted Girdled Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is fairly widespread and locally abundant, with no significant threats.

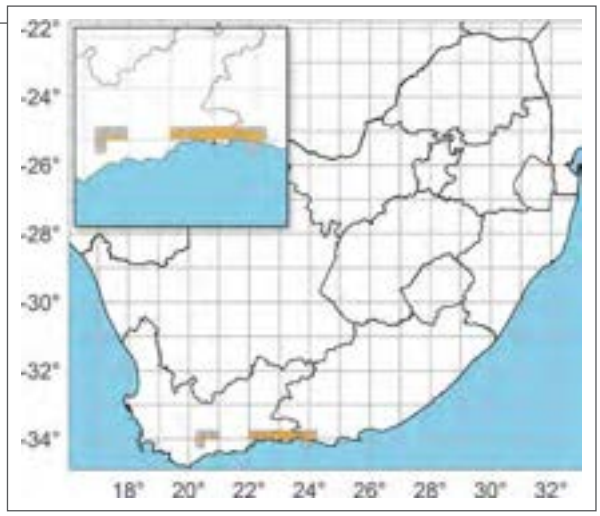
Taxonomic notes: Previously included in the genus *Cordylus*, but with the erection of the genus *Ninurta* (Stanley et al. 2011), the remaining taxonomic issue concerns the subpopulation in the Langeberg. There are distinct morphological differences between lizards from this subpopulation and the main subpopulation to the east. *Other important names*: *Cordylus coeruleopunctatus*.

Distribution: Occurs in the southern Cape Fold Mountains as two disjunct populations in the Langeberg and the Outeniqua and Tsitsikamma mountain ranges, respectively. The apparent subpopulations could be an artefact of less intensive collection efforts in the intervening areas. *EOO*: 7 460 km^2; *Distribution*: 4 300 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A rupicolous species that is abundant in suitable Mesic Fynbos habitat and Forest fringes. It occurs on rocky outcrops, coastal cliffs and mountain tops (Branch 1998). *Habitat*: Shrubland.

Threats: There are no major threats to this species as it occurs in areas that have little habitat transformation. *Use and trade*: This species is listed in CITES Appendix II, but it has never been exported for the pet trade under CITES so trade is not considered a threat (UNEP-WCMC 2020).



Population trend: The population size is thought to be stable as the rupicolous, mountainous habitat of this lizard has not been impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Ninurta coeruleopunctatus, Robertson Pass, Western Cape province (© L. Kemp).

Family **Cordylidae**

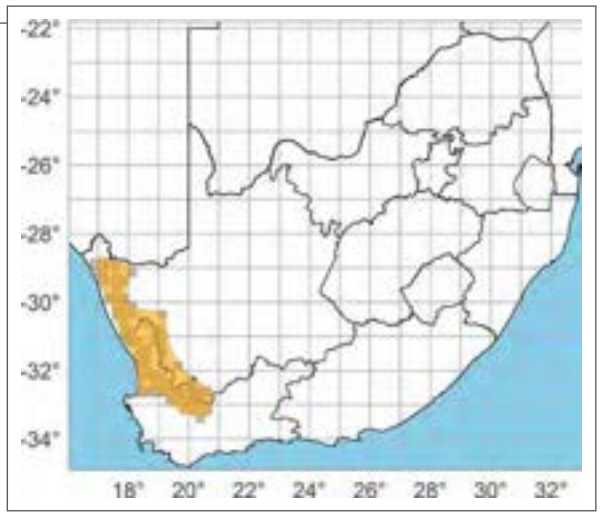
Ouroborus cataphractus (Boie, 1828)

Armadillo Girdled Lizard

South African endemic

NT – Near Threatened A4d (Global)

Assessors: Tolley, K.A., Alexander, G.J., Pietersen, D.W., Conradie, W., Weeber, J.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Vulnerable (Global IUCN assessment) as *Cordylus cataphractus*.
1994: Vulnerable (Global IUCN assessment) as *Cordylus cataphractus*.

Reason for recent change: Genuine.

Assessment rationale: Despite this species being widespread and locally abundant, removals from the wild for the pet trade are a concern. This species is in high demand in the pet trade, and although CITES trade statistics indicate that most trade is of captive bred individuals, it is likely that many of these could be wild-caught individuals. The continued interception of illegal consignments in South Africa suggests that illegal poaching could have an impact on the wild population. The level of removals from the wild is unquantified, but data from the CITES trade statistics suggest there is wide-scale laundering of wild-caught individuals as captive bred. These removals are potentially high enough to cause a 30% population decline over three generations. Therefore, a Near Threatened category is precautionary given the suspected level of illegal trade. There are no significant threats to the habitat within its range.

Taxonomic notes: Previously included in the genus *Cordylus* but with the erection of the monotypic genus *Ouroborus* (Stanley et al. 2011), there are no remaining taxonomic issues. *Other important names*: *Cordylus cataphractus*.

Distribution: Occurs in western South Africa from the arid Richtersveld in the north, to the mesic, northern extent of the Cape Fold Mountains and the southwestern Karoo (Shuttleworth 2006). In the

Ouroborus cataphractus, Lambert's Bay, Western Cape province (© C. Keates).

north, the distribution reaches about 130 km inland, widening to more than 300 km inland in the south. *EOO*: 85 000 km^2; *Distribution*: 62 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occur in aggregations of individuals of different ages and both sexes sheltering together in sandstone rock crevices. It is particularly abundant in rock outcrops on the western coastal lowlands, but also on lower mountain slopes (Hayward & Mouton 2007; Shuttleworth et al. 2008) of the Succulent Karoo and Nama-Karoo biomes. This species has low fecundity (Flemming & Mouton 2002) and given that it is group-living and strictly rupicolous, it is likely to have low dispersal rates. *Habitat*: Shrubland.

Threats: Overexploitation and poaching for the pet trade is a concern, although the level of removals are unquantified. Given the presumed low vagility, it is unlikely that overharvested aggregations would easily recover through dispersal from other aggregations. *Use and trade*: This species is listed in CITES Appendix II and is found in the pet trade. There are no wild-caught individuals recorded as exported since 2000, and the majority of wild-caught individuals exported prior to 2000 were recorded as not having originated from South Africa. However, this is a South African endemic, so wild-caught exports from non-range states are most likely to have been laundered. Hundreds of captive bred individuals were reported as being exported from South Africa and non-range states such as France, Hong Kong and Germany between 2010 and 2018 (UNEP-WCMC 2020). Given that captive breeding would initially rely on stocking through wild harvesting, but that there have been no exports of wild harvested individuals in decades, the F1 and captive bred individuals traded through CITES are likely to have been of illegal origin. Furthermore, there have been recent arrests in the Western and Northern Cape provinces of foreign nationals in possession of dozens of individuals without provincial or CITES permits, suggesting that there is an active illegal trade in this species.

Population trend: The scope of the illegal and legal trade requires quantification as the level of removals could cause declines. Given that these lizards live in groups, this could facilitate the removal of entire aggregations by harvesting for the illegal pet trade, causing local extinctions. It is unlikely that these aggregations would recover due to a low probability of dispersal from other aggregations. For this reason, the species is included on the South African National Sensitive Species List (http://nssl.sanbi.org.za/). The

Ouroborus cataphractus, Strandfontein, Western Cape province (© M. Lundberg).

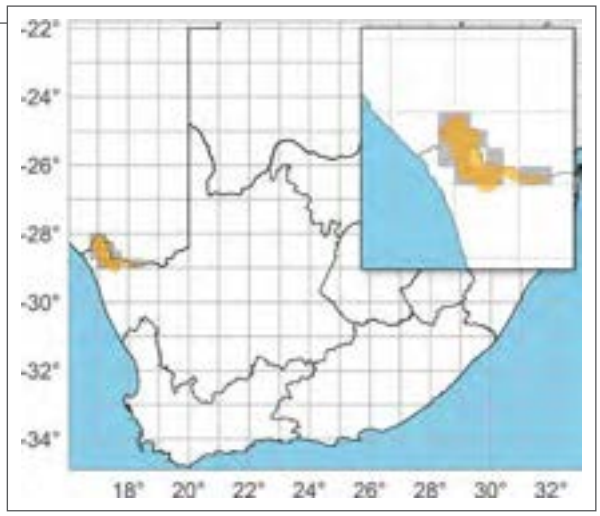
generation length for this species has not been specifically quantified but is believed to be approximately 13–15 years (breeding onset at about five years, maximum longevity about 25 years) based on field data from a related species, *Smaug giganteus* (Parusnath et al. 2017) and live *O. cataphractus* specimens in captivity for at least 15 years (W. Conradie, pers. obs. 2022). Therefore, the removals from the wild for trade (legal and illegal) should be quantified over a period of about 40–50 years (three generations). Given that removals have been ongoing and are likely to continue, it would be necessary to estimate the population reduction over this same time period. Although the illegal trade data are not available, it is possible that the accumulated number of removals could reach a 30% decline in the population over 40–50 years.

Conservation and research recommendations: It is plausible that illegal removal from the wild for the pet trade is a significant threat to this species, particularly the targeted collection of entire aggregations. The level of illegal trade and the impacts on this species need to be quantified urgently and combined with the CITES data to evaluate past patterns. Strong law enforcement and prosecution relating to illegal harvesting should be maintained. CITES permit applications should be heavily scrutinised, and non-range states should not be allowed to export F1 individuals without accompanying CITES export permits of wild-caught animals from South Africa. Proof of pedigree should be required for all CITES exports. This species is a candidate for non-detriment findings by the South African Scientific Authority. It is currently listed on the National Sensitive Species List (http://nssl.sanbi.org.za/).

Family **Cordylidae**

Platysaurus attenboroughi Whiting, Branch, Pepper & Keogh, 2015

Attenborough's Flat Lizard



LC – Least Concern (Regional)

Assessors: Weeber, J., Bates, M.F., Whiting, M.J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Assessment rationale: Regionally, this species has a moderately large distribution within which there are no substantial threats. It has been recorded from numerous localities within both the South African and Namibian sections of the Ai-Ais Richtersveld Transfrontier Park.

Taxonomic notes: This taxon was until recently considered a population of *Platysaurus capensis* (Whiting et al. 2015). *Other important names*: *Platysaurus capensis*.

Distribution: Occurs along the lower Orange River from Goodhouse to the Richtersveld in the Northern Cape province of South Africa, extending northwards into southern Namibia, with records from the Hunsberg, Huamsib and Ploegberg mountains, as well as the Fish River Canyon (Whiting et al. 2015). *EOO*: 20 340 km²; *Distribution*: 13 000 km².

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in arid habitats and is associated with rocky outcrops (predominantly granite in this region) where individuals take refuge in rock fissures. *Habitat*: Savanna, Shrubland.

Threats: There are no major threats to this species. It does, however, occur in an area that is predicted to be heavily influenced by climate change (Engelbrecht et al. 2015), and this could be a threat in the future.

Population trend: The population is not considered to be in decline given that impacts are minor over most of its range.

Conservation and research recommendations: No recommendations.

Platysaurus attenboroughi, male colouration, Fish River Canyon, Namibia (© M. Whiting).

Platysaurus attenboroughi, female, Richtersveld, Northern Cape province (© R. van Huyssteen).

Family **Cordylidae**

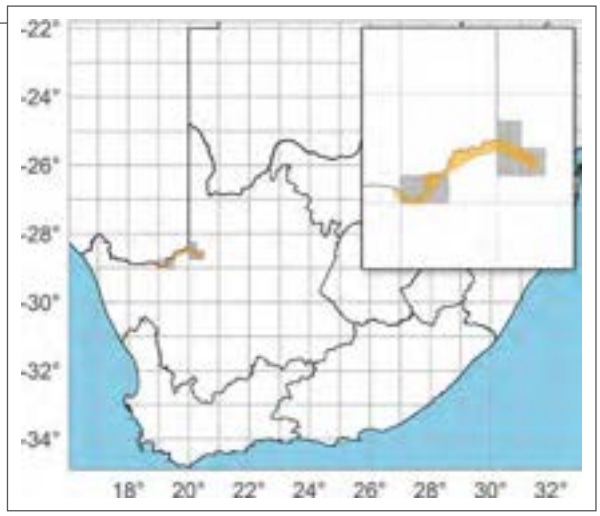
Platysaurus broadleyi Branch & Whiting, 1997

Augrabies Flat Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Whiting, M.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: *Platysaurus broadleyi* is extremely abundant in Augrabies Falls National Park, and elsewhere along the Orange River. Although there has been expansion of viticulture along sections of the Orange River that could threaten local populations through habitat alteration and the use of insecticides, the majority of the range is not transformed.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs along the Orange River Valley and tributaries, centred on Augrabies Falls to 200 km west and 50 km north along the Bak Putz River Valley. The distribution appears to be linked to the river valleys, because lizard density declines with distance from the river valley. It has not been recorded from Namibia but may be present there. *EOO*: 4 820 km^2; *Distribution*: 1 580 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Associated with rock outcrops along the Orange River and its tributaries at elevations of 610–730 m a.s.l. (Branch & Whiting 1997). At Augrabies Falls National Park, where it is abundant, it occurs on smooth granite, especially along the banks of the Orange River. It appears to favour narrow, deep rock crevices along the river where it seeks refuge. Fig trees (*Ficus* spp.) are used for shade,

Platysaurus broadleyi, female colouration, Augrabies, Northern Cape province (© L. Verburgt).

Family **Cordylidae**

Platysaurus broadleyi, male colouration, Augrabies, Northern Cape province (© K. Tolley).

and lizards feed on ripe figs when these are available (Whiting & Greef 1997). *Habitat*: Shrubland.

Threats: Viticulture has expanded as an agro-industry along the Orange River in the last decades, but at present this is not considered a direct threat to this species as it impacts only a small portion of the range (see Geo Terra Image 2015, 2016). *Use and trade*: This species, as well as others in the genus, are readily available for sale online, but the level of trade has not been quantified. Because this species is not listed on CITES and the trade is not quantified, collecting and overexploitation could be a potential threat.

Population trend: Because this species occurs mainly in an arid region that has not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: A thorough survey of the Orange River and its tributaries, especially in Namibia, might allow for a better assessment of the distribution and connectivity along river valleys. It could be useful to quantify trade, both in terms of availability and whether collection and export permits are issued for this species by the provincial conservation authority.

Family **Cordylidae**

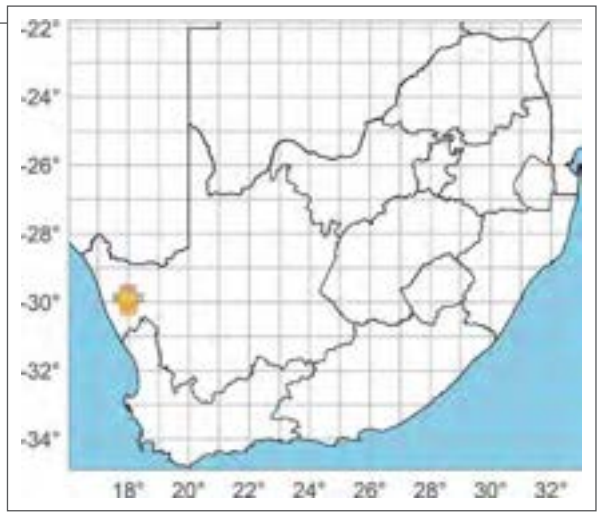
Platysaurus capensis Smith, 1844

Namaqua Flat Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Whiting, M.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is relatively widespread and common with no major threats.

Taxonomic notes: With the description of the northern population of *Platysaurus capensis* as a new species, *P. attenboroughi* (Whiting et al. 2015), there are no further outstanding taxonomic issues. *Other important names*: none.

Distribution: Occurs in the greater Kamiesberg region of Namaqualand, Northern Cape province, South Africa, from Goegap Nature Reserve near Springbok southwards to Garies (Branch & Whiting 1997). *EOO*: 4 780 km²; *Distribution*: 4 670 km².

Country of occurrence: South Africa.

Habitat and ecology: A rupicolous species typically living on granite, gneiss and shale rock outcrops in the Succulent Karoo biome. It uses crevices in small rock outcrops or the lower slopes of mountains, at elevations of 40–1 000 m a.s.l. (Branch & Whiting 1997). *Habitat*: Shrubland.

Threats: There are no major threats to this species, as it occurs in an area that has not undergone significant habitat transformation. *Use and trade*: The species is not listed on CITES and is not known to be traded.

Population trend: The population size is thought to be stable as the arid, rupicolous habitat of this lizard has not been impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Platysaurus capensis, male colouration, Kamieskroon, Northern Cape province (© M. Whiting).

Family **Cordylidae**

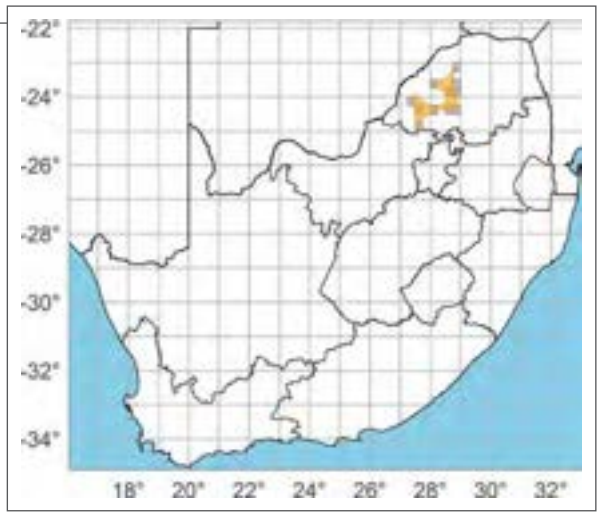
Platysaurus guttatus Smith, 1849

Dwarf Flat Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Whiting, M.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a large range, and although there is severe habitat transformation and fragmentation in the south, most of the remaining area is fairly intact.

Taxonomic notes: This species is sympatric with *P. minor*, but they are morphologically and genetically distinguishable (Jacobsen 1989; M. Whiting, unpubl. data 2020). While sympatric, they are usually not syntopic (Jacobsen 1989). *Other important names*: none.

Distribution: Occurs in west-central Limpopo province, South Africa (Jacobsen 1989), from the Waterberg Plateau extending to western Blouberg. *EOO*: 17 630 km^2; *Distribution*: 8 870 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This rupicolous species inhabits small rocky ridges and small outcrops from elevations of

Platysaurus guttatus, female colouration, farm Sweethome, near Sebotane, Limpopo province (© M. Whiting).

Platysaurus guttatus, male colouration, farm Sweethome, near Sebotane, Limpopo province (© M. Whiting).

Platysaurus guttatus, male colouration, Blouberg, Limpopo province (© R.I. Stander).

1 000–1 300 m a.s.l., where it shelters in very narrow crevices (< 5 mm diameter; Jacobsen 1989). *Habitat*: Savanna.

Threats: Although the southern portion of the range is heavily transformed, there are no major threats to this species.

Population trend: The extent of habitat transformation is minor in relation to the large range of this species. It is thus assumed that any local population declines do not pose a threat to the species.

Conservation and research recommendations: No recommendations.

Family **Cordylidae**

Platysaurus intermedius Matschie, 1891

Common Flat Lizard

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Alexander, G.J., Bates, M.F.

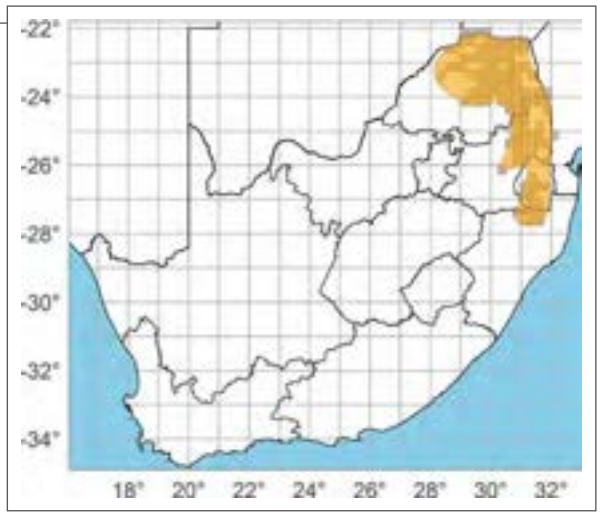
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2010: Least Concern (Global IUCN Assessment).

Subspecies assessed:
2014: *Platysaurus intermedius intermedius* – Least Concern (SARCA).
2014: *Platysaurus intermedius inopinus* – Endangered (SARCA).
2014: *Platysaurus intermedius natalensis* – Least Concern (SARCA).
2014: *Platysaurus intermedius parvus* – Least Concern (SARCA).
2014: *Platysaurus intermedius rhodesianus* – Least Concern (SARCA).
2014: *Platysaurus intermedius wilhelmi* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Platysaurus intermedius intermedius* Matschie, 1861.
- *Platysaurus intermedius inopinus* Jacobsen, 1994.
- *Platysaurus intermedius natalensis* FitzSimons, 1948.
- *Platysaurus intermedius parvus* Broadley, 1976.
- *Platysaurus intermedius rhodesianus* FitzSimons, 1941.
- *Platysaurus intermedius wilhelmi* Hewitt, 1909.

Assessment rationale: Although there is some habitat transformation within the range, this lizard is widely distributed and considered well protected.

Taxonomic notes: Previous (Scott et al. 2004) and current (S. Keogh, unpubl. data 2018) phylogenetic studies suggest that the *P. intermedius* complex will undergo significant taxonomic change and some of the subspecies may be raised to full species. For example, a phylogeny (Scott et al. 2004) placed *P. intermedius wilhelmi* in a clade with *P. lebomboensis*, separate from *P. i. intermedius*. Furthermore, *P. i. rhodesianus* is in a clade with *P. imperator* and



Platysaurus intermedius inopinus, female colouration, Alpine Dam, Limpopo province (© G.K. Nicolau).

Platysaurus intermedius inopinus, male colouration, Alpine Dam, Limpopo province (© G.K. Nicolau).

Family **Cordylidae**

P. torquatus, rather than with *P. i. intermedius* and the other *P. intermedius* subspecies. In addition, *P. i. rhodesianus* is widespread, with some populations separated by significant physical barriers (e.g., the Limpopo River) that are expected to constrain gene flow. Also, a number of populations show significant morphological variation, suggesting that *P. i. rhodesianus* may represent a species complex. *Other important names*: none.

Distribution: Occurs across southern Africa in discrete populations that correspond with nine subspecies of which six occur in South Africa. Three of the subspecies occur only in northeastern South Africa (*P. i. inopinus, P. i. parvus* and *P. i. wilhelmi*), whereas *P. i. natalensis* is found in South Africa and Eswatini, *P. i. intermedius* occurs in South Africa and southern Mozambique, and *P. i. rhodesianus* occurs in northern Limpopo province, South Africa, eastern Botswana, southern Zimbabwe and parts of the Manica Plateau in Mozambique. *EOO*: 156 000 km^2; *Distribution*: 113 000 km^2.

Countries of occurrence: Botswana, Eswatini, Malawi, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Inhabits rock outcrops and ridges of various rock types including granite, sandstone and quartzite, within Mesic Savanna. Occurs mainly between elevations of 600–1 100 m a.s.l., although elevational range varies between subspecies. *Habitat*: Savanna.

Threats: There are no substantial threats to the species, particularly because it favours rock outcrops where habitat transformation is minimal. However, the intervening areas can be heavily transformed in

Platysaurus intermedius intermedius, male colouration, Makgeng, Limpopo province (© R.I. Stander).

Platysaurus intermedius natalensis, male colouration, Itala Game Reserve, KwaZulu-Natal province (© K. Kyle).

Platysaurus intermedius natalensis, female colouration, Godlwayo, KwaZulu-Natal province (© T. Ping).

Platysaurus intermedius parvus, low northern slopes form of male colouration, Blouberg, Limpopo province (© R.I. Stander).

Family **Cordylidae**

some places, which might disrupt metapopulation processes and the persistence of populations in the long term.

Population trend: Although occurrence can be patchy due to habitat requirements, it is locally abundant and not considered to be in decline.

Conservation and research recommendations: An investigation into the taxonomic status of the subspecies is required.

Platysaurus intermedius parvus, female colouration, Blouberg, Limpopo province (© L. Verburgt).

Platysaurus intermedius rhodesianus, male colouration, Tshikhudini, Limpopo province (© R.I. Stander).

Platysaurus intermedius rhodesianus, female colouration, Tshipise, Limpopo province (© R.I. Stander).

Platysaurus intermedius wilhelmi, male colouration, Sabie, Mpumalanga province (© G.K. Nicolau).

Platysaurus intermedius wilhelmi, female colouration, Sabie, Mpumalanga province (© G.K. Nicolau).

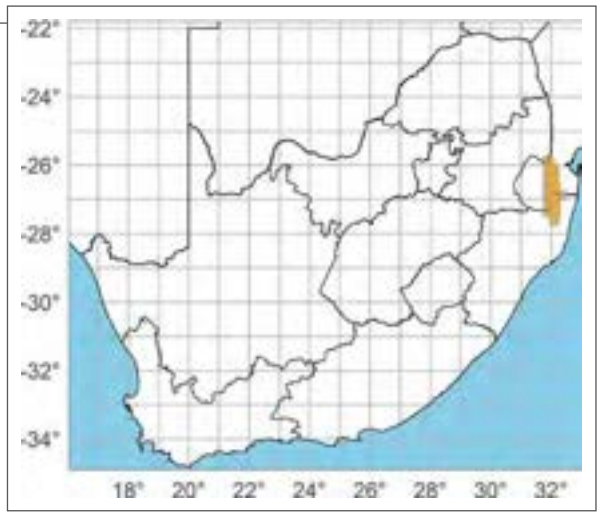
Platysaurus lebomboensis Jacobsen, 1994

Lebombo Flat Lizard

Regional near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Whiting, M.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although this species has only a moderate-sized range, it occurs on the slopes of the Lebombo Mountains and in several protected areas where there are no significant active threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: This species occurs in the Lebombo Mountain range in northern South Africa, eastern Eswatini and southern Mozambique (Jacobsen 1994). *EOO*: 8 340 km^2; *Distribution*: 8 220 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa.

Habitat and ecology: Occupies rock outcrops, specifically igneous rhyolite outcrops, where it favours bedrock and associated boulders, taking refuge in rocky crevices. Occurs at elevations of 600–800 m a.s.l. (Jacobsen 1989, 1994b). *Habitat*: Savanna.

Threats: There are no obvious threats to this species, which occurs along an extensive mountain range that has not been significantly transformed. However, the southern extent of the range has some land transformation through small-scale agriculture, which has increased in the last few decades (see Geo Terra Image 2015, 2016).

Population trend: Despite the small geographic range of this species, it occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Platysaurus lebomboensis, male colouration, Manyiseni region, Lebombo Mountains, KwaZulu-Natal province (© M. Burger).

Family **Cordylidae**

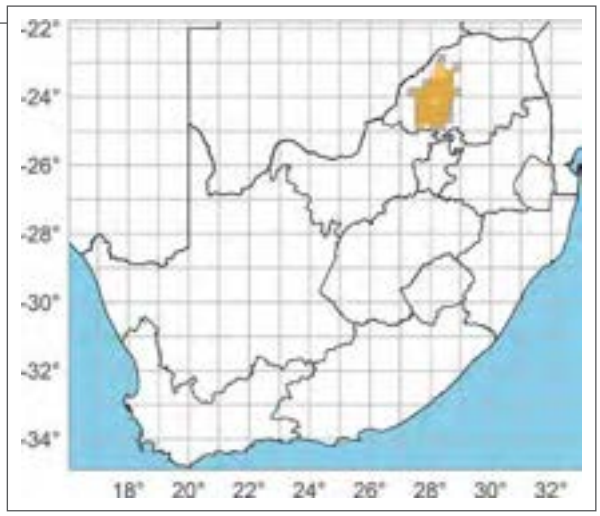
Platysaurus minor FitzSimons, 1930

Waterberg Flat Lizard

South African endemic

LC - Least Concern (Global)

Assessors: Bates, M.F., Whiting, M.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although there is some habitat fragmentation in the south of the range, this species has a relatively wide distribution and is locally abundant with no major threats.

Taxonomic notes: This species is sympatric with *P. guttatus*, but they are morphologically and genetically distinguishable (Jacobsen 1989; M. Whiting, unpubl. data 2020). While sympatric, they are usually not syntopic (Jacobsen 1989). *Other important names*: none.

Distribution: Occurs in west-central Limpopo province, South Africa, throughout the Waterberg, extending into the foothills of the Blouberg range to the north. *EOO*: 23 300 km^2; *Distribution*: 19 200 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on large, isolated rock outcrops and lower slopes of mountains, at elevations of 900–2 000 m a.s.l. It prefers areas of rocky shelf with associated boulders and narrow crevices that can be used for refuge (Jacobsen 1989). *Habitat*: Savanna.

Threats: Although the southern portion of the range is heavily transformed, there are no major threats to this species.

Population trend: The extent of habitat transformation is minor in relation to the large range of this species. It is thus assumed that any local population declines do not pose a threat to the species.

Conservation and research recommendations: No recommendations.

Platysaurus minor, male colouration, Blouberg, Limpopo province (© R.I. Stander).

Platysaurus minor, male colouration, foothills of the Blouberg, Limpopo province (© M. Whiting).

Family **Cordylidae**

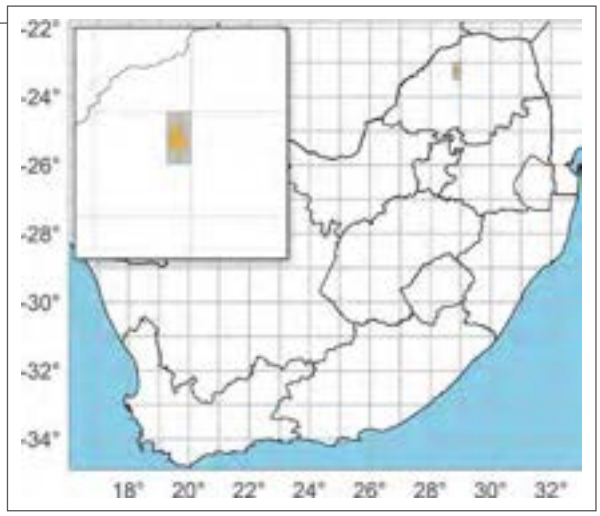
Platysaurus monotropis Jacobsen, 1994

Orange-throated Flat Lizard

South African endemic

NT – Near Threatened B1b(iii) (Global)

Assessors: Bates, M.F., Whiting, M.J.



Previous Red List categories:
2018: Near Threatened (Global IUCN assessment).
2017: Endangered (Global IUCN assessment).
2014: Endangered (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a small distribution, and the area surrounding the mountains where it occurs is heavily impacted by agriculture. The habitat in the mountains, however, is relatively intact but the ecological integrity of the region is generally poor. Assessed as Endangered in 2017 due to a small EOO and AOO and by occurring in fewer than five locations. The application of locations for the Endangered status was based on a general decline in habitat quality in the area outside the distribution. Examination of the recent land cover shows that most of the habitat within the range is intact, with only about 12% of the habitat having been lost in total. Threat-defined locations cannot be invoked as there is no single threatening event that could rapidly affect all individuals of the taxon present given that the habitat loss is gradual.

Taxonomic notes: No current taxonomic issues, but see Jacobsen (1989) for historic taxonomic context. *Other important names*: *Platysaurus* sp. 'Orange'.

Distribution: Has a small distribution, occurring on the Blouberg, the Makgabeng Plateau and nearby

Platysaurus monotropis, female colouration, Blouberg, Limpopo province (© R.I. Stander).

Family **Cordylidae**

Platysaurus monotropis, male colouration, foothills of the Blouberg, Limpopo province (© M. Whiting).

rock outcrops in Limpopo province, South Africa. *EOO*: 433 km^2; *Distribution*: 355 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Found in montane habitat at approximately 1 000–1 300 m a.s.l. and also occurs on small, isolated outcrops situated between the two mountainous areas (Korner et al. 2000). The species is dependent on narrow rocky crevices for refuge. *Habitat*: Savanna.

Threats: There is a general decline in habitat in the region due to agriculture, overgrazing and wood harvesting. However, these activities do not affect the lizards directly. The future severity of these threats may depend upon human population growth in nearby communities, and there is the possibility of new emerging threats such as mining and destruction of natural rock formations. *Use and trade*: Not known to be traded at present, although other species in the genus are in the pet trade. This species might be vulnerable to local overharvesting.

Population trend: The species is not considered to be in decline given that the primary habitat is intact. Given that the species utilises rocky outcrops, there could be a number of subpopulations, but the population is not considered severely fragmented as the subpopulations on the individual rock outcrops are assumed to have connectivity.

Conservation and research recommendations: Surveys of potential suitable habitat could assist in assessing the extent of the distribution and connectivity. The overall quality of habitat in the region is poor, so it is imperative to gain an understanding of how vegetation and insect availability interact and affect the presence and abundance of *P. monotropis*.

Family **Cordylidae**

Platysaurus orientalis FitzSimons, 1941

Sekhukhune Flat Lizard

South African endemic

LC – Least Concern (Global)

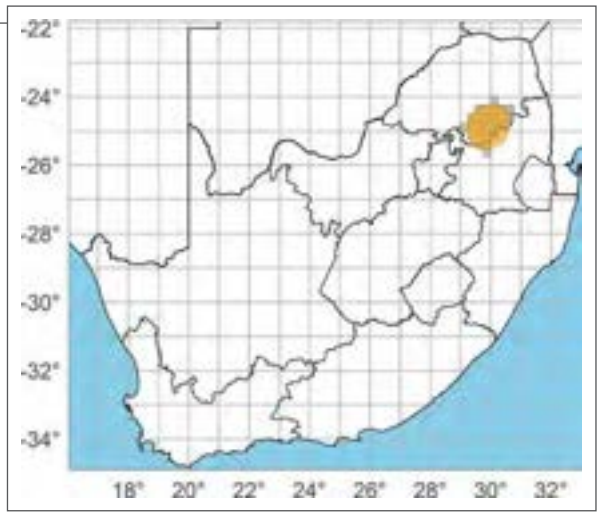
Assessors: Bates, M.F., Whiting, M.J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Platysaurus orientalis orientalis* – Least Concern (SARCA).
2014: *Platysaurus orientalis fitzsimonsi* – Near Threatened (SARCA).

Subspecies included under this assessment:
- *Platysaurus orientalis orientalis* FitzSimons, 1941.
- *Platysaurus orientalis fitzsimonsi* Loveridge, 1944.

Assessment rationale: Widespread and relatively common with no major threats.



Taxonomic notes: The genus *Platysaurus* requires taxonomic revision, and a phylogenetic analysis should help resolve the status of the two subspecies, *P. orientalis orientalis* and *P. o. fitzsimonsi*. *Other important names*: *Platysaurus minor orientalis*; *Platysaurus guttatus orientalis*; *Platysaurus guttatus fitzsimonsi*; *Platysaurus fitzsimonsi*.

Distribution: This species occurs along the eastern escarpment and associated mountain ranges in

Platysaurus orientalis fitzsimonsi, female colouration, Schuinsdraai, Limpopo province (© R.I. Stander).

Family **Cordylidae**

Platysaurus orientalis orientalis, male colouration, Potlake, Limpopo province (© R.I. Stander).

Platysaurus orientalis fitzsimonsi, male colouration, Schuinsdraai, Limpopo province (© R.I. Stander).

Mpumalanga and Limpopo provinces, South Africa, mainly in the Sekhukhune District. *EOO*: 16 200 km^2; *Distribution*: 16 200 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Shelters in crevices in rock outcrops, exposed bedrock and free-standing boulders that are typically composed of granite and quartzite (Jacobsen 1989; Jacobsen & Newbery 1989). *Habitat*: Grassland, Savanna.

Threats: Rock and mineral mining and associated infrastructure (e.g., dams, pipelines and roads) is causing destruction of habitat and is an active threat in a small portion of the distribution but is likely to expand (D.W. Pietersen, pers. obs. 2019). The species has limited dispersal ability and is therefore susceptible to localised habitat destruction. *Use and trade*: Not known to be utilised, although other species in the genus are in the pet trade.

Population trend: The population is not considered to be in decline given that most of the distribution has relatively low impacts.

Conservation and research recommendations: No recommendations or conservation actions are suggested, although it should be noted that numerous new mines are being proposed for the area and such activities could impact the species.

Family **Cordylidae**

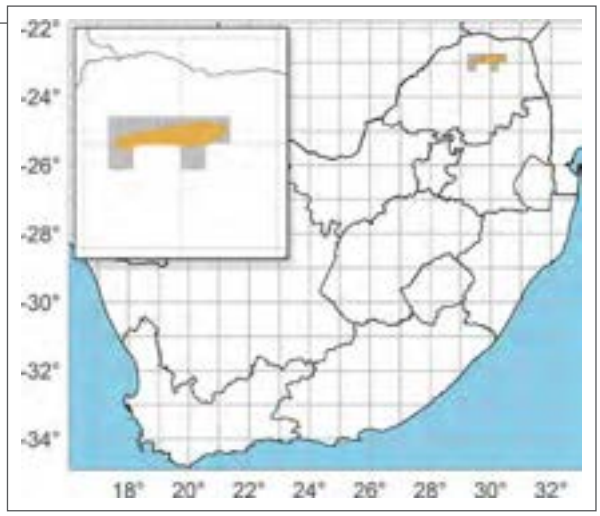
Platysaurus relictus Broadley, 1976

Soutpansberg Flat Lizard

South African endemic

NT – Near Threatened A3c (Global)

Assessors: Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J., Tolley, K.A., Bates, M.F., Whiting, M.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Lower Risk/Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a small range, but there has not been a substantial decline in habitat extent or quality from habitat transformation. However, niche modelling suggests that the range may contract by more than two-thirds by the year 2070. Because this species is inferred to have a generation length of 6–8 years, population declines over three generations could be roughly 30%, which would nearly qualify as Vulnerable under criterion A3c. There is, however, uncertainty with the generation length, and the suspected range decline is derived

Platysaurus relictus, Tshirolwe, Limpopo province (© R.I. Stander).

Family **Cordylidae**

only from a niche model. Thus, the lack of certainty means that the species could be either Vulnerable or Least Concern. Taking a precautionary approach, the species is currently considered Near Threatened.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Endemic to the western and central Soutpansberg in Limpopo province, South Africa (Petford et al. 2019). Within the Soutpansberg, it is most common on the northern slopes where there is less rainfall and more exposed rock without large tracts of forest (Jacobsen 1989). *EOO*: 2 330 km^2; *Distribution*: 2 140 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on north-facing rocky slopes and the crowns of ridges on the Soutpansberg, where it is dependent on narrow rock crevices for refuge. Rocky areas with extensive sheet rock, and loose boulders are particularly favoured (Jacobsen 1988b, 1989). *Habitat*: Grassland, Savanna.

Threats: Based on a conservative climate change scenario, Petford and Alexander (2021a) predict a range reduction of more than two-thirds of the current range by the year 2070. Although agriculture was previously thought to be a threat (Bates & Whiting 2018), inspection of recent land cover map layers suggests this is not a plausible threat. *Use and trade*: No known trade.

Population trend: Possibly in decline due to upslope displacement from current and predicted climate change. This is already likely to be causing a decline in range size and an increase in population fragmentation. With a suspected generation length of roughly 6–8 years (G. Alexander, pers. obs. 1984), population declines over three generations could be as high as 30%.

Conservation and research recommendations: A newly declared national protected area in the Soutpansberg (Western Soutpansberg Nature Reserve; Limpopo Provincial Notice 159 of 2021, 3 December 2021, No. 3220) puts several thousand hectares of the range under protection. Climate change is expected to be affecting this species at present and into the future. It would therefore be useful to conduct additional surveys to assess population trends.

Family **Cordylidae**

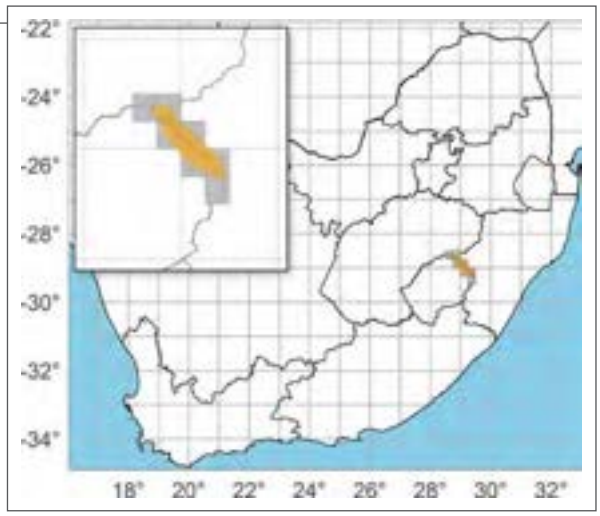
Pseudocordylus langi Loveridge, 1944

Lang's Crag Lizard

Regional endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Cunningham, M.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Lower Risk/Near threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: This species occurs at high elevations that are not impacted by habitat loss or fragmentation, and large parts of its range are within protected areas. Assessed as Near Threatened in 2017 due to a single location being affected by climate change. Limited elevational response in the event of climate change could be an emerging threat, but at present there is no data or analyses that suggest this region (or this species) could be significantly affected. For a species to be considered at risk of extinction to climate change, a systematic evaluation of the magnitude of reduction and the likely mechanisms are needed (IUCN 2019). Given that direct threats are not plausible, and that the potential negative response to climate change requires further appraisal, the category of Least Concern is appropriate.

Taxonomic notes: There are no taxonomic issues. *Other important names*: *Cordylus langi*.

Distribution: Occurs in the uKhahlamba-Drakensberg with the majority of the range between Giant's Castle and Sentinel Peak in KwaZulu-Natal province, South

Pseudocordylus langi, Chain Ladder, Drakensberg, Free State province (© M.F. Bates).

Family **Cordylidae**

Africa, with a northwesterly extension into the QwaQwa Drakensberg of the Free State province, and a single record from Mechachaneng Peak in adjacent northern Lesotho. The distribution is patchy, and the species appears to be restricted to the rocky formations along the edge of the Drakensberg Escarpment, particularly north-facing slopes. *EOO*: 2 040 km^2; *Distribution*: 1 880 km^2.

Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: Restricted to cliffs and crevices at the escarpment edge, on nearby rocky buttresses and on summits, at elevations of 2 700–3 100 m a.s.l. *Habitat*: Grassland.

Threats: There is no significant threat from habitat loss, as the species occurs primarily at high elevations where there is little habitat transformation. Climate change might reduce suitable habitat at the highest elevations, and this could constitute a future threat as there is limited opportunity for an elevational response. *Use and trade*: This species is listed in CITES Appendix II, but it has never been legally exported from South Africa. It has been reported as exported from Mozambique in 1988 (500 individuals; UNEP-WCMC 2020), but it does not occur in that country. These might represent exports of a cordylid endemic to Mozambique that were exported under the name *P. langi*, or potentially the laundering of individuals through non-range states.

Population trend: The species is not considered to be in decline given that it is distributed in an area with no notable impacts or threats. It is not known how this species might be impacted by climate change given its narrow elevational range (± 400 m) near the summits of mountains.

Conservation and research recommendations: Research using species distribution models and measures of the physiological tolerances and responses to climate change of this lizard would assist to assess whether predicted climate change might negatively impact this species.

Family **Cordylidae**

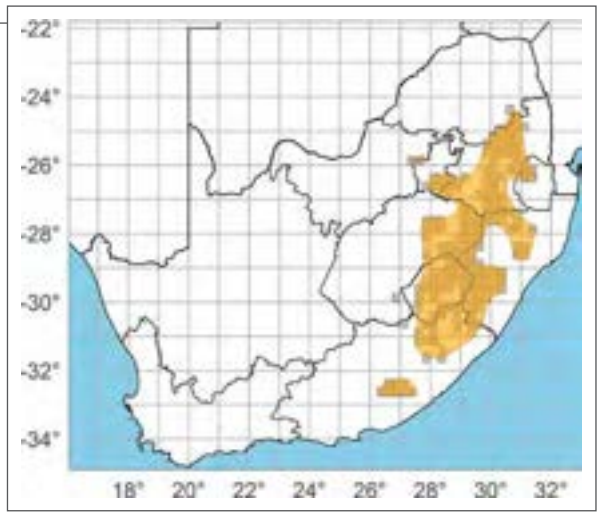
Pseudocordylus melanotus (Smith, 1838)

Highveld Crag Lizard

Regional endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Pseudocordylus melanotus melanotus* – Least Concern (SARCA).
2014: *Pseudocordylus melanotus subviridis* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Pseudocordylus melanotus melanotus* (Smith, 1838).
- *Pseudocordylus melanotus subviridis* (Smith, 1838).

Assessment rationale: This is a widespread, common species. Because it is rupicolous, its habitat is generally unlikely to be impacted through loss in quality or extent.

Taxonomic notes: Genetic and morphological data suggest that there are species-level differences between *P. m. melanotus* and *P. m. subviridis* and possibly within *P. m. melanotus* (Bates 2007b). A multi-locus phylogeny also shows that the subspecies of *P. melanotus* are paraphyletic, with *P. m. subviridis* falling in the *P. spinosus* clade, rather than the *P. m. melanotus* clade (Stanley et al. 2011). *Other important names*: *Cordylus melanotus*.

Distribution: This species is widespread in eastern South Africa, also ranging across most of Lesotho and western Eswatini. Most of the distribution is within the Drakensberg and associated mountains, but it is patchy and limited to higher elevations (1 100–3 200 m a.s.l.). There appear to be two additional isolated subpopulations: the Magaliesberg subpopulation in Gauteng and North West provinces (Bates & Whittington-Jones 2009) and the Amatola and adjacent Great Winterberg subpopulation in the Eastern Cape province. There are a few isolated records that require confirmation. *EOO*: 298 000 km^2; *Distribution*: 164 000 km^2.

Pseudocordylus melanotus melanotus, Wakkerstroom, Mpumalanga province (© L. Kemp).

Pseudocordylus melanotus melanotus, Long Tom Pass, Mpumalanga province (© L. Kemp).

Family **Cordylidae**

Pseudocordylus melanotus subviridis, Highmoor Nature Reserve, KwaZulu-Natal province (© C.R. Hundermark).

Pseudocordylus melanotus subviridis, Letseng Mine, Lesotho (© L. Verburgt).

Countries of occurrence: Eswatini, Lesotho, South Africa.

Habitat and ecology: This species occurs on rock outcrops in the Grassland biome at elevations of 1 100–3 200 m a.s.l. where mist and overcast weather is common (De Waal 1978; Jacobsen 1989; Bates 2005b). It shelters in narrow crevices between rocks, often on steep cliffs in mountainous areas. *Habitat*: Grassland.

Threats: There are no direct threats as this species is strictly rupicolous and its habitat is therefore unlikely to be directly impacted by transformation. Climatic change may be an emerging threat for this lizard (Perold et al. 2021), but the interaction between physical habitat requirements and thermal physiology are complex (McConnachie et al. 2007) so the response to climate change is difficult to predict. *Use and trade*: This species is listed in CITES Appendix II, and *P. melanotus* (subspecies not specified) has been recorded by CITES as being exported for the pet trade, most recently in 2014. However, these exports are few and are supposedly of captive bred individuals (UNEP-WCMC 2020). Few individuals are reported as wild-caught exports, and none since 1997.

Population trend: The widespread range and abundance of this species mitigates against the negative effects of local population declines.

Conservation and research recommendations: A phylogenetic analysis would be useful to resolve the status of the taxa in this species complex. A more detailed study of this lizard's response to climate change is required.

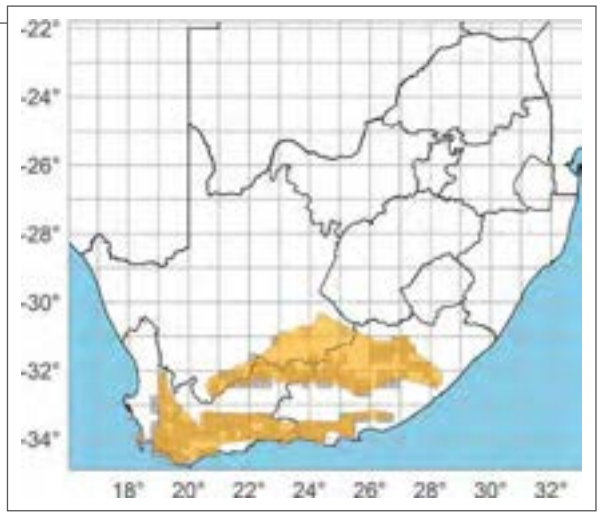
Pseudocordylus microlepidotus (Cuvier, 1829)

Cape Crag Lizard

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Pseudocordylus microlepidotus fasciatus* – Least Concern (SARCA).
2014: *Pseudocordylus microlepidotus microlepidotus* – Least Concern (SARCA).
2014: *Pseudocordylus microlepidotus namaquensis* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Pseudocordylus microlepidotus microlepidotus* (Cuvier, 1829).
- *Pseudocordylus microlepidotus fasciatus* (Smith, 1838).
- *Pseudocordylus microlepidotus namaquensis* Hewitt, 1927.

Assessment rationale: This species is widespread and abundant with no major threats.

Taxonomic notes: Although there are some morphological features unique to each subspecies (FitzSimons 1943; Bates 2005b), their taxonomic status is uncertain. In the east of the distribution, *P. microlepidotus* may be parapatric with *P. melanotus subviridis* (Bates 2014c) and this could cause confusion with identifications. *Other important names*: *Cordylus microlepidotus*.

Distribution: This species occurs throughout the Cape Fold Mountains and inland mountain ranges along the Great Escarpment, South Africa (Bates

Pseudocordylus microlepidotus namaquensis, Karoo National Park, Western Cape province (© W. Conradie).

Pseudocordylus microlepidotus fasciatus, Asante Sana, Eastern Cape province (© W. Conradie).

Family **Cordylidae**

Pseudocordylus microlepidotus microlepidotus, Mount Rochelle, Western Cape province (© L. Kemp).

Pseudocordylus microlepidotus microlepidotus, Baviaanskloof, Western Cape province (© T. Ping).

2005b). The species has also been recorded from high elevations on large inselbergs within the Great Karoo. *EOO*: 292 000 km^2; *Distribution*: 159 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Uses rock outcrops in montane regions (20–1 920 m a.s.l.) in a range of habitats and shelters in crevices or under rocks. It is known to use large crevices that are partly filled with soil, in which it may excavate a chamber (Branch 1998; Bates 2005b). *Habitat*: Grassland, Shrubland.

Threats: There are no significant threats to this species. *Use and trade*: This species is listed in CITES Appendix II, but a total of only ten individuals were legally removed from the wild in 1997 in South Africa for export (UNEP-WCMC 2020), and it therefore cannot be considered as being extensively traded.

Population trend: This species is not considered to be in decline given its large distribution within which there are minimal threats.

Conservation and research recommendations: The uncertain taxonomy of this group requires additional work, and this should be informed by a phylogenetic analysis with comprehensive geographic sampling.

Pseudocordylus microlepidotus microlepidotus, Kammanassie, Western Cape province (© A.A. Turner).

Family **Cordylidae**

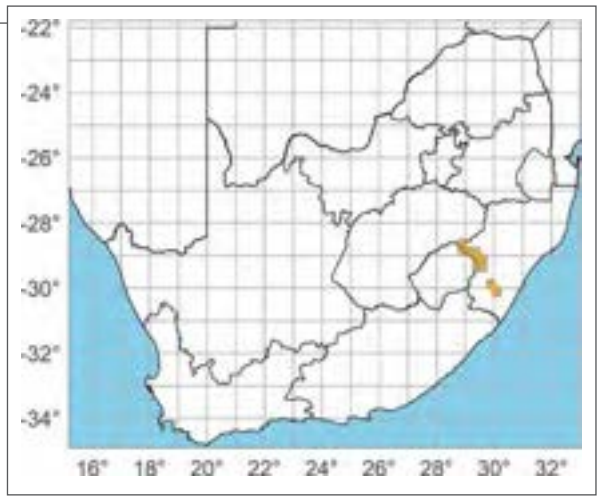
Pseudocordylus spinosus FitzSimons, 1947

Spiny Crag Lizard

South African endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
2010: Least Concern (Global IUCN assessment) as *Cordylus spinosus*.
1996: Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: While the distribution of this species is not large, the majority of the main Drakensberg subpopulation lies within a protected area (uKhahlamba-Drakensberg Park). Although the southern subpopulation is in an area that is heavily transformed, this forms a small portion of the overall range. Assessed in 2017 as Near Threatened due to a decline in habitat quality, this affects only a minor part of the range, with most of the range in a largely inaccessible protected area. It is unlikely that the species has an elevated risk of extinction at present.

Taxonomic notes: A multi-locus phylogeny shows that the subspecies *P. melanotus subviridis* falls in the *P. spinosus* clade, not the *P. m. melanotus* clade (Stanley et al. 2011). Although morphologically quite distinct from *P. m. subviridis*, *P. spinosus* from Goodoo Pass in the Drakensberg also shared the same 16S mitochondrial haplotype as several *P. m. subviridis* individuals (Bates 2007b). Isolated subpopulations at

Pseudocordylus spinosus, male colouration, Organ Pipes Pass, Drakensberg, KwaZulu-Natal province (© G.K. Nicolau).

Family **Cordylidae**

Pseudocordylus spinosus, female colouration, Monk's Cowl, KwaZulu-Natal province (© T. Ping).

Ixopo and Donnybrook in southern KwaZulu-Natal province require taxonomic investigation. *Other important names*: *Cordylus spinosus*.

Distribution: This species occurs along the lower and mid-elevation slopes of the Drakensberg, with an isolated subpopulation near Donnybrook and Ixopo in southern KwaZulu-Natal province, South Africa (Bates 2005b; Bourquin 2004). *EOO*: 4 500 km^2; *Distribution*: 3 215 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on outcrops of small rocks scattered in Montane Grassland at elevations of 900–2 500 m a.s.l., often utilising crevices close to the ground (Bates 2005b). *Habitat*: Grassland.

Threats: Afforestation is a threat in some areas, especially in the Ixopo and Donnybrook region of southern KwaZulu-Natal province. The subpopulation that occurs there may be under greater threat than the main subpopulation. *Use and trade*: This species is listed in CITES Appendix II, but it has not been recorded by CITES as being exported for the pet trade (UNEP-WCMC 2020).

Population trend: The species is not considered to be in significant decline as most of the range is not greatly impacted by habitat loss. Historical declines may have occurred in the southern portion of the range as a result of afforestation. Nevertheless, the low elevation subpopulation that occurs at the Ixopo and Donnybrook region is likely in decline due to significant habitat loss in that area.

Conservation and research recommendations: The taxonomic status of the isolated populations should be investigated, and the possibility of declines for the Ixopo and Donnybrook subpopulation should be assessed.

Family **Cordylidae**

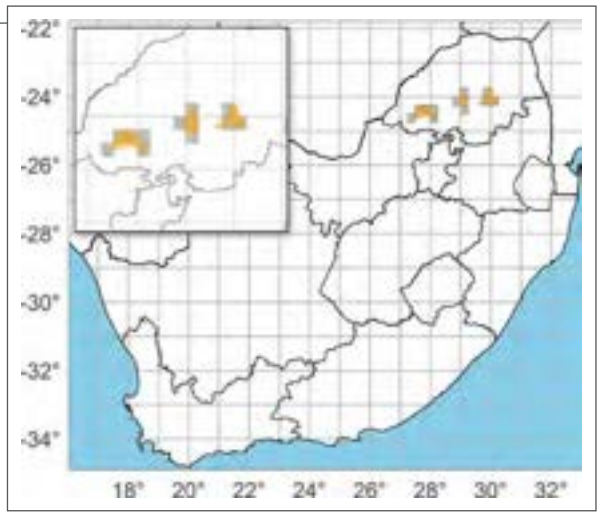
Pseudocordylus transvaalensis FitzSimons, 1943

Northern Crag Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a moderate-sized distribution within which there has been some loss in quality and extent of habitat due to afforestation and urban development. However, substantial parts of its range are not transformed. In addition, each of the subpopulations has a large portion of its range in protected areas. Previously assessed in 2017 as Near Threatened due to continuing decline in habitat extent and quality due to afforestation, logging roads, fires and other activities, which were of concern due to the restricted range and low dispersal capability of this species. However, according to the IUCN guidelines (IUCN Standards and Petitions Committee 2019), the range cannot be considered restricted. Although the extent of habitat transformation within the range is ± 20%, these lizards appear to be fairly tolerant of disturbance across the larger landscape as long as rocky outcrops remain intact. Therefore, a category of Least Concern is appropriate.

Taxonomic notes: Based on morphological and phylogenetic analyses, *P. transvaalensis* was found to be a valid species rather than a subspecies of *P. melanotus* (Jacobsen 1989; Bates 2005b, 2007b; Stanley

Pseudocordylus transvaalensis, Wolkberg, Limpopo province (© R.I. Stander).

Family **Cordylidae**

Pseudocordylus transvaalensis, Woodbush, Limpopo province (© L. Verburgt).

et al. 2011). The three allopatric populations differ morphologically (Bates 2007b), but it is not possible to assess if they are differentiated genetically due to incomplete sampling (Bates 2007b; Stanley et al. 2011). *Other important names*: *Cordylus transvaalensis*.

Distribution: There are presumably three allopatric subpopulations, i.e., western (Thabazimbi area), central (Mokopane area) and eastern (Woodbush/Haenertsburg area) in Limpopo province, South Africa (Jacobsen 1989; Bates 2005b). *EOO*: 17 280 km^2; *Distribution*: 4 300 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Individuals shelter in crevices or under rocks, on the upper slopes of hills or on ridges in the Savanna and Grassland biomes, and they occur at low densities (Jacobsen 1989; Bates 2007b). The western subpopulation is associated with grassy, wooded hills. The central subpopulation occurs mainly in bushveld, and the eastern subpopulation is associated with Grassland mosaic. *Habitat*: Grassland, Savanna.

Threats: Afforestation may be a threat for the eastern subpopulation, with construction and use of logging roads having also destroyed habitat. Much of the surrounding landscape is of very poor quality, but this species is rupicolous and as such, the effects should not be significant. Nevertheless, habitat fragmentation has the potential to isolate and fragment subpopulations. Should land transformation accelerate in the region, *P. transvaalensis* is potentially at greater risk because of its intrinsically low dispersal capabilities and small-sized range. *Use and trade*: This species is listed in CITES Appendix II, but only four individuals have been exported under CITES legislation (in 2010) for use as 'small leather products' (UNEP-WCMC 2020).

Population trend: Although the surrounding habitat is impacted by humans, the rocky outcrops where this lizard occurs are not transformed. Therefore, the population is not thought to be in decline.

Conservation and research recommendations: An assessment of whether there is connectivity between the subpopulations could be useful to assess the overall impact of habitat loss for the species.

Family **Cordylidae**

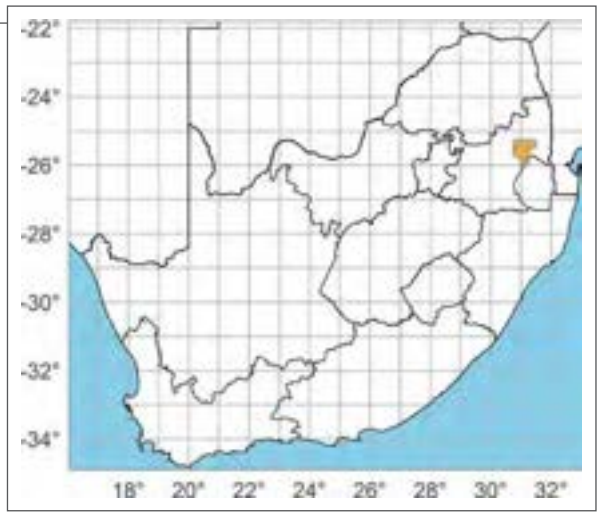
Smaug barbertonensis (Van Dam, 1921)

Barberton Dragon Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Weeber, J., Pietersen, D.W., Alexander, G.J., Tolley, K.A., Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Smaug warreni barbertonensis*.

Assessment rationale: Although this species has a small range, its rupicolous habitat has not undergone substantial habitat transformation.

Taxonomic notes: Previously considered a subspecies of *S. warreni*, but elevated and split into two species – *S. barbertonensis* and *S. swazicus* (Bates & Stanley 2020). *Other important names*: *Cordylus warreni barbertonensis*; *Smaug warreni barbertonensis*.

Distribution: This species has a relatively small distribution in the Barberton area of eastern Mpumalanga province, South Africa (Bates & Stanley 2020). *EOO*: 3,060 km²; *Distribution*: 2,940 km²

Country of occurrence: South Africa.

Habitat and ecology: A rupicolous species that occurs at elevations of approximately 700–1 000 m a.s.l. and inhabits rock outcrops on hillsides, often in the partial shade of trees (Jacobsen 1989; Bates & Stanley 2020). *Habitat*: Grassland, Savanna.

Threats: There are no major threats to this species, although habitat transformation may be affecting the western part of the range. *Use and trade*: This species is listed in CITES Appendix II but has not been exported for the pet trade under CITES (UNEP-WCMC 2020). Because of similarity in appearance, and because this species was previously considered a subspecies of *S. warreni*, it is possible that some specimens recorded in the pet trade (up to as recently as 2015) as the latter species (UNEP-WCMC 2020) are in fact referable to *S. barbertonensis*.

Population trend: The population size is thought to be stable as the rupicolous habitat of this lizard has not been impacted by habitat transformation.

Conservation and research recommendations: Research is needed to investigate the claim that removal of trees from the species' habitat may have a negative effect given that this lizard often selects crevices in the partial shade of trees (Jacobsen 1989; Bates & Stanley 2020).

Smaug barbertonensis, Mbombela, Mpumalanga province (© T. Busschau).

Family **Cordylidae**

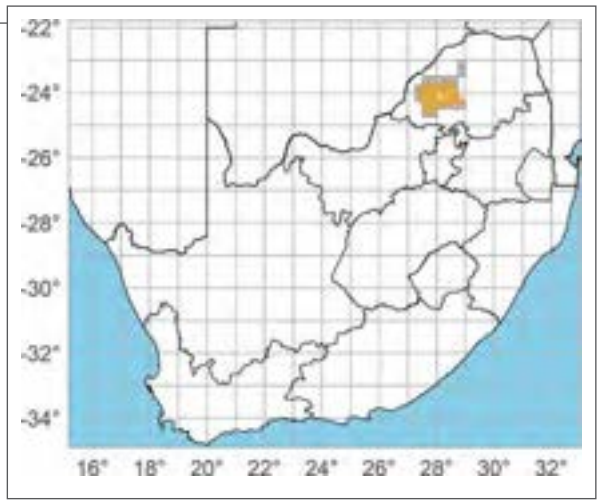
Smaug breyeri (Van Dam, 1921)

Waterberg Dragon Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: There are no significant threats to this species, with negligible habitat alteration within the range.

Taxonomic notes: The isolated western records attributed to both this species and *S. vandami* by Jacobsen (1989) and Mouton (2014b) are in fact referable only to *S. breyeri* (Stanley & Bates 2014). *Other important names*: *Cordylus warreni breyeri*; *Cordylus breyeri*.

Distribution: Occurs in the Waterberg and surrounding areas in Limpopo province, South Africa (Jacobsen 1989). There are disjunct populations at Blouberg and nearby Makgabeng. *EOO*: 17 990 km^2; *Distribution*: 11 900 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A rupicolous species that occurs at elevations of 700–1 700 m a.s.l. and prefers rock outcrops in open Savanna, where it shelters in deep-shaded cracks on the cool side of rock outcrops (Jacobsen 1989; Branch 1998). *Habitat*: Savanna.

Threats: There are no known plausible threats to this species, as there is little habitat alteration within its range, and it is not in trade. *Use and trade*: This species is listed in CITES Appendix II, but it has not been recorded under CITES as traded (UNEP-WCMC 2020).

Population trend: The population size is thought to be stable as the rupicolous habitat of this lizard has not been impacted by habitat transformation.

Conservation and research recommendations: None.

Smaug breyeri, near Lephalale, Limpopo province (© L. Verburgt).

Family **Cordylidae**

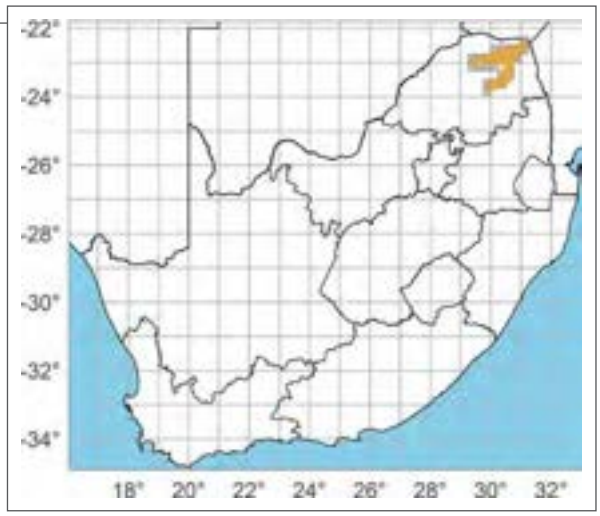
Smaug depressus (FitzSimons, 1930)

Flat Dragon Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Smaug warreni depressus*.

Assessment rationale: This species has a large range within which there is minimal habitat alteration.

Taxonomic notes: Previously considered a subspecies of *S. warreni*, but with its elevation to a full species (Stanley & Bates 2014), there are no further taxonomic issues. *Other important names*: *Cordylus warreni depressus*; *Cordylus laevigatus*; *Smaug warreni depressus*.

Distribution: Occurs in Limpopo province, South Africa, in the Soutpansberg range and on smaller ridges to the south, extending to the Woodbush area (Jacobsen 1989; Stanley & Bates 2014). *EOO*: 17 000 km^2; *Distribution*: 11 200 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A rupicolous species occurring on rock outcrops on hillsides and mountain summits in Savanna (Jacobsen 1989). *Habitat*: Savanna.

Threats: There are no major threats to this species. *Use and trade*: The species is listed in CITES Appendix II, but it has never been exported under CITES for trade (UNEP-WCMC 2020).

Population trend: The population size is thought to be stable as the mountainous and rupicolous habitat of this lizard has not been significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Smaug depressus, Soutpansberg, Limpopo province (© R. van Huyssteen).

Smaug depressus, Soutpansberg, Limpopo province (© L. Verburgt).

Family **Cordylidae**

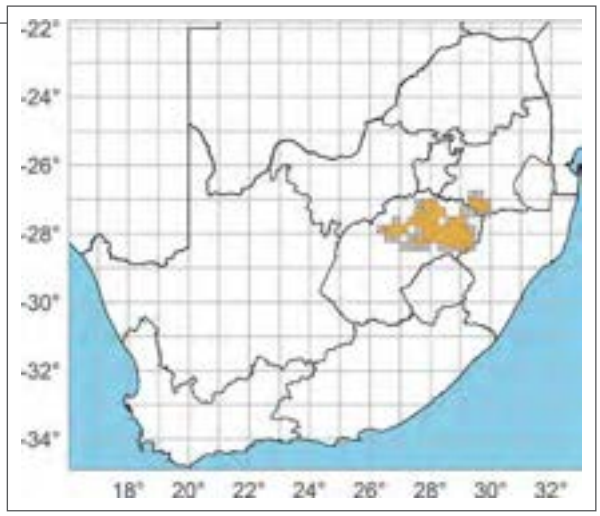
Smaug giganteus (Smith, 1844)

Giant Dragon Lizard

South African endemic

VU – Vulnerable A2bcd+4bcd (Global)

Assessors: Alexander, G.J., Tolley, K.A., Bates, M.F., Mouton, P.L.F.N.



Previous Red List categories:

2018: Vulnerable (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).
1996: Vulnerable (Global IUCN assessment) as *Cordylus giganteus*.
1994: Vulnerable (Global IUCN assessment) as *Cordylus giganteus*.

Assessment rationale: This species is considered Vulnerable given quantified substantial population declines over the last three generations. The population has declined by ± 48% due to the heavy transformation of its habitat (Parusnath et al. 2017), coupled with targeted removals from the wild for the exotic pet and traditional medicine trades. These combined impacts have not ceased and effective conservation measures are needed.

Taxonomic notes: No taxonomic issues. *Other important names*: *Cordylus giganteus*.

Distribution: Occurs in Highveld Grasslands of the northern Free State province and the southwestern parts of Mpumalanga province, South Africa (Jacobsen 1989; De Waal 1978; Parusnath et al. 2017). Records of this species in KwaZulu-Natal province (e.g., Bourquin 2004) apparently all refer to introduced populations that did not become established, and there are no confirmed records of natural populations in the province (Armstrong 2011). A record from Witsieshoek in the Free State province and two records from western Lesotho (Ambrose 2006) are considered doubtful. *EOO*: 40 600 km^2; *Distribution*: 22 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs only in Highveld Grassland and is unique among cordylids in being an obligate burrower, living in self-excavated burrows (Branch 1998; Parusnath et al. 2017). It can be considered a habitat specialist that is highly philopatric. Although it is a large lizard, it does not easily disperse across the landscape to establish new burrows should its habitat be destroyed. *Habitat*: Grassland.

Smaug giganteus, a confiscated specimen from unknown locality in Free State province (© L. Kemp).

Threats: The areas inhabited by this species are under intense pressure from agriculture, particularly maize and sunflower cultivation, as well as coal mining (Newbery & Petersen 1982/83; Parusnath et al. 2017), with large parts being highly transformed or degraded. Although habitat loss is considered a primary cause of population declines, most of the impact at present appears to be due to a combination of these longer-term declines and poaching (Parusnath et al. 2017). Losses are exacerbated by poor recruitment ability. In addition, large portions of the Grassland habitat are underlain by coal beds and exploitation of coal for fuel has and could result in further habitat loss. *Use and trade*: This species is listed on CITES Appendix II and is one of the most exported species of South African lizard, with 1 194 permitted individuals exported between 1985 and 2014 for the pet trade (Parusnath et al. 2017; UNEP-WCMC 2020). It is also found in the illegal pet trade and is harvested for traditional medicines (see Parusnath et al. 2017 for a review), so the actual number of animals removed from the wild is not known and is potentially much higher than figures reported by CITES. Most CITES exports are to the USA, Japan and Germany, with about 30% of total CITES exports listed as captive bred. In the last decade, 70% of the animals exported were purported to be captive bred. However, the captive bred exports are questionable because there are no published records of captive breeding success (Parusnath et al. 2017) and the species does not readily breed in captivity (Loehr et al. 2016). A significant number of captive animals are also exported from other countries, such as Mozambique, India and Italy, suggesting that wild-caught animals are laundered as captive bred animals from South Africa and other countries (Parusnath et al. 2017).

Population trend: The population has been estimated at ± 677 000 adults, which is a decline of at least 48% from the estimated historical population size (Parusnath et al. 2017). Females usually reproduce only every second year (Van Wyk 1991), and the generation length has been estimated at 15 years (Parusnath et al. 2017), suggesting that potential recovery from population declines might be slow.

Conservation and research recommendations: The most tangible threats to this species are habitat transformation and targeted removals of adults from the wild for the exotic pet and traditional medicine trades. Extinction risk for this species might be greatly reduced if these threats are lowered. This species does not currently occur within any protected area, so incorporation of multiple large patches of Grassland into the protected area network would be a first step to reduce extinction risk. The threat from illegal trade is likely substantial and strong law enforcement to curb this is urgently needed. These actions should be linked to long-term population monitoring programmes and stewardship programmes for landowners to encourage protection of existing natural habitats as well as rehabilitation of degraded or transformed habitats. An assessment of gene flow might assist to evaluate whether natural recolonisation is feasible, or whether translocations should be considered for areas that are rehabilitated. This species is a candidate for a Biodiversity Management Plan (BMP; see South African National Environmental Management Biodiversity Act, Act No. 10 of 2004).

Smaug giganteus, Wilge Inn, Free State province (© L. Verburgt).

Family **Cordylidae**

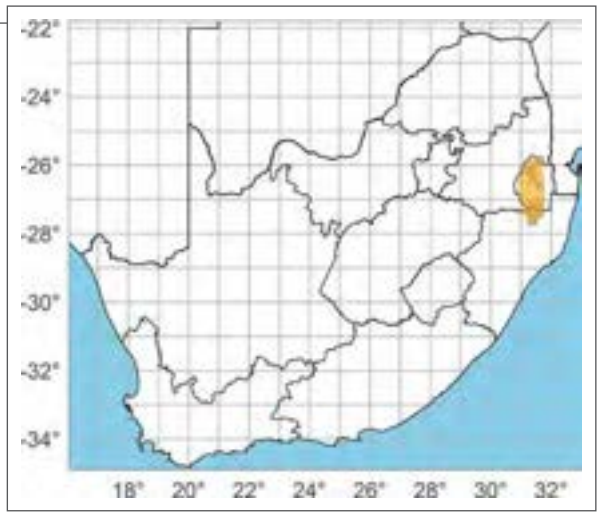
Smaug swazicus Bates & Stanley, 2020

Swazi Dragon Lizard

LC – Least Concern (Global)

Regional endemic

Assessors: Conradie, W., Weeber, J., Pietersen, D.W., Alexander, G.J., Tolley, K.A.



Previous Red List categories:
Not previously assessed.

Assessment rationale: This species has a moderate-sized range and its rupicolous habitat has not undergone substantial habitat transformation.

Taxonomic notes: Previously part of the *S. warreni* group, but recently described as a new species (Bates & Stanley 2020). *Other important names*: *Cordylus warreni barbertonensis*; *Smaug warreni barbertonensis*.

Distribution: Occurs from northern Eswatini, extending southwards, marginally into KwaZulu-Natal province (Bates & Stanley 2020). *EOO*: 12 900 km^2; *Distribution*: 12 800 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: A rupicolous species that inhabits rock outcrops on hillsides from about 400 to 1 110 m a.s.l., usually in the partial shade of trees (Bates & Stanley 2020). *Habitat*: Savanna, Grassland.

Threats: There are no major threats to this species, although habitat transformation may be affecting portions of the population, particularly in areas where trees may have been removed (Bates & Stanley 2020). *Use and trade*: This species is listed in CITES Appendix II. Because of similarity in appearance, and because this species was previously considered part of *S. barbertonensis*, it is possible that some specimens recorded in the pet trade (up to as recently as 2015) as the latter species (UNEP-WCMC 2020) are in fact referable to *S. swazicus*.

Population trend: The population size is thought to be stable as the rupicolous habitat of this lizard has not been significantly impacted by habitat transformation.

Conservation and research recommendations: Research is needed to investigate whether removal of trees has a negative effect given that this lizard often selects crevices in the partial shade of trees (Bates & Stanley 2020).

Smaug swazicus, Malolotja Nature Reserve, Eswatini (© E. Stanley).

Family **Cordylidae**

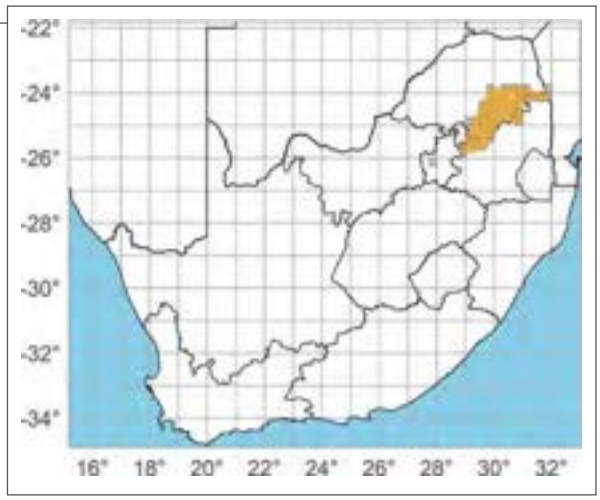
Smaug vandami (FitzSimons, 1930)

Van Dam's Dragon Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Alexander, G.J., Conradie, W., Pietersen, D.W., Weeber, J., Mouton, P.L.F.N., Bates, M.F., Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no substantial threats.

Taxonomic notes: The isolated western records attributed to this species by Jacobsen (1989) and Mouton (2014b) are in fact referable only to *S. breyeri* (Stanley & Bates 2014). *Other important names*: *Cordylus vandami*.

Distribution: Occurs in southern Limpopo and northern Mpumalanga provinces in South Africa, extending as far east as the Mozambique border (Jacobsen 1989; Branch 1998). It extends southwards, marginally into northeast Gauteng province. There is also an isolated population in Johannesburg along the Northcliff Ridge (G.J. Alexander & K.A. Tolley, pers. obs. 2020) approximately 140 km southwest of the main distribution. It may also occur in Mozambique. The isolated western records of this species (Jacobsen 1989) are referable to *S. breyeri* (Stanley & Bates 2014). *EOO*: 83 000 km^2; *Distribution*: 29 400 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs on shady, rocky outcrops in mesic habitats where it shelters in large cracks (Jacobsen 1989; Branch 1998). *Habitat*: Grassland, Savanna.

Smaug vandami, Blyde River Canyon, Limpopo province (© C.R. Hundermark).

Family **Cordylidae**

Smaug vandami, Johannesburg, Gauteng province (© J. van Rooyen).

Threats: There are no major threats to this species. *Use and trade*: This species is in the pet trade, but with most exports reported as captive bred or F1 (UNEP-WCMC 2020). The only reported wild-caught individuals were ten individuals exported to the USA in 2008. Between 2008 and 2015, approximately 80 individuals were exported as captive bred or F1, primarily from South Africa.

Population trend: The wide distribution, lack of substantial habitat transformation and relative abundance of this species mitigate any local population declines.

Conservation and research recommendations: The subpopulation at Northcliff Ridge, which is approximately 140 km southwest of the main distribution, requires further investigation, as does the possible presence of this species in Mozambique.

Smaug warreni (Boulenger, 1908)

Lebombo Dragon Lizard

Regional near-endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Mouton, P.L.F.N.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Smaug warreni warreni*.

Assessment rationale: There are no major threats to this species, as it occurs in an area with relatively little habitat alteration.

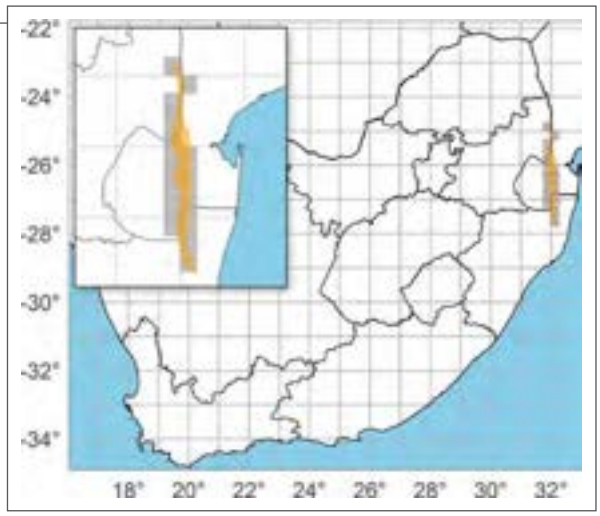
Taxonomic notes: All former subspecies of *S. warreni* have been raised to full species (Bates & Stanley 2020). *Other important names*: *Cordylus warreni warreni*; *Smaug warreni warreni*.

Distribution: Endemic to the Lebombo Mountains, occurring from northeastern KwaZulu-Natal province, South Africa through Eswatini to eastern Mpumalanga province and adjacent Mozambique (Jacobsen 1989; Bates & Stanley 2020). *EOO*: 7 840 km^2; *Distribution*: 5 040 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa.

Habitat and ecology: A rupicolous species occurring on rock outcrops along the Lebombo Mountains at elevations of 100–700 m a.s.l. (Jacobsen 1989; Bates & Stanley 2020). *Habitat*: Savanna.

Threats: There are no major threats. *Use and trade*: This species is listed on CITES Appendix II, with about 2 900 individuals recorded as being exported between 2005 and 2018 from several countries including non-range states (UNEP-WCMC 2020). The majority of these represent removals from the wild from Mozambique, and about 20% are recorded as captive bred or F1 with a South African origin. It is possible that some exports of *S. warreni* were individuals of *S. barbertonensis* or *S. swazicus* because these are very similar in appearance, and because they were previously considered subspecies of *S. warreni*.



Population trend: In spite of the moderate-sized geographic range of this species, it occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: The level of trade should be assessed for this species, particularly in terms of whether removals from the wild (including parents of F1 exports) are targeting specific populations.

Smaug warreni, Lebombo Mountains, KwaZulu-Natal province (© D. van Eyssen).

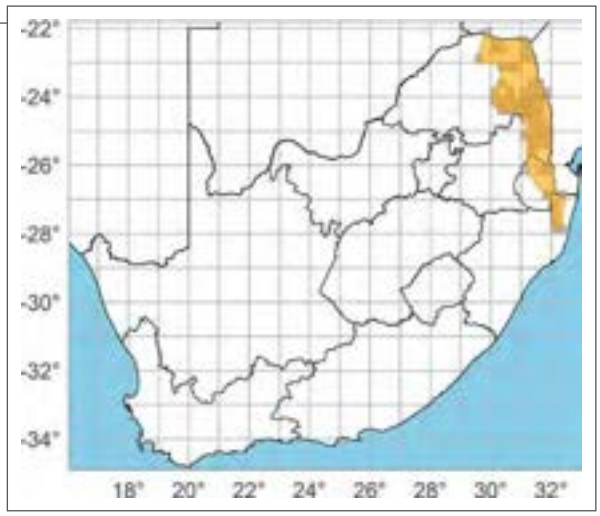
Family **Gerrhosauridae**

Broadleysaurus major (Duméril, 1851)

Rough-scaled Plated Lizard

LC – Least Concern (Regional)

Assessor: Bates, M.F.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: The species is widespread in eastern South Africa, with much of the distribution being contained within protected areas.

Taxonomic notes: No outstanding taxonomic issues. *Other important names*: *Gerrhosaurus major*.

Distribution: Widely distributed from South Africa and Eswatini through East Africa to South Sudan, with scattered populations in Central and West Africa (Broadley 1987). In South Africa, *B. major* occurs in eastern Limpopo and Mpumalanga provinces, and northeastern KwaZulu-Natal province. *EOO*: 88 000 km^2; *Distribution*: 65 100 km^2.

Countries of occurrence: Benin, Cameroon, Central African Republic, Democratic Republic of the Congo, Eswatini, Ethiopia, Ghana, Kenya, Malawi, Mozambique, Nigeria, Senegal, Somalia, South Africa, South Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Often occurs in small, well-vegetated rock outcrops, sheltering in crevices, mammal burrows and termite mounds, as well as in underground chambers and under rocks (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: Parts of the range are impacted by habitat transformation such as agriculture, plantations and human settlement. However, the species is well protected with approximately one-third of its range falling within protected areas.

Population trend: Although there has been some habitat loss in the area, the large geographic range and abundance of this lizard mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Broadleysaurus major, Hoedspruit, Limpopo province (© D.W. Pietersen).

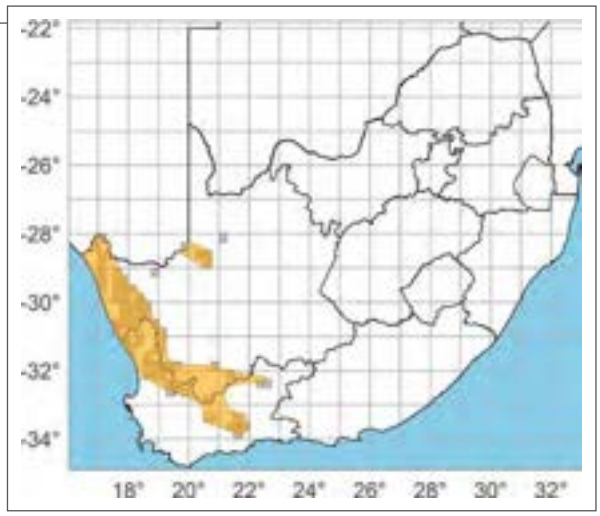
Broadleysaurus major, Sengo-Senge region, Mozambique (© L. Verburgt).

Cordylosaurus subtessellatus (Smith, 1844)

Dwarf Plated Lizard

LC – Least Concern (Regional)

Assessor: Bates, M.F.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and fairly common with no significant threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs in the arid western parts of southern Africa, from southwestern Angola through western Namibia (excluding true desert) to the Northern and Western Cape provinces of South Africa (Visser 1984e; Branch 1998; O'Connor et al. 2006). In South Africa it occurs from the central Cape Fold Mountains and the Karoo to the arid northwest, where it enters Namibia and extends into the Kalahari. There are several records outside the interpreted distribution that suggest the distribution might be larger and more continuous. *EOO*: 249 000 km²; *Distribution*: 90 300 km².

Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: Occurs in arid succulent and karroid vegetation on rocky, sandstone or slate outcrops from sea level to approximately 1 200 m a.s.l. (Branch & Braack 1989). Shelters under stones and in holes. *Habitat*: Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Cordylosaurus subtesselatus, Steinkopf, Northern Cape province (© L. Kemp).

Family **Gerrhosauridae**

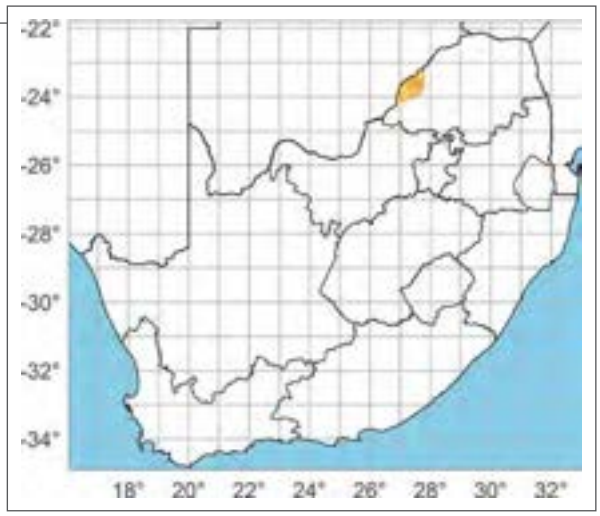
Gerrhosaurus auritus Boettger, 1887

Kalahari Plated Lizard

South African peripheral

LC – Least Concern (Global)

Assessors: Baptista, N., Bauer, A.M., Becker, F., Ceríaco, L.M.P., Conradie, W.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).

Assessment rationale: This species is widely distributed and abundant with no significant threats.

Taxonomic notes: No issues. *Other important names*: *Gerrhosaurus multilineatus auritus*.

Distribution: This lizard ranges from extreme north-central South Africa through Botswana and Namibia to eastern Angola and western Zambia, and eastwards to northwestern Zimbabwe (Branch 1998; Griffin 2003; Marques et al. 2018). In South Africa, there are records from northwest Limpopo province, although the species possibly occurs more widely. *EOO*: 6 220 km²; *Distribution*: 5 760 km².

Countries of occurrence: Angola, Botswana, Namibia, South Africa, Zambia.

Habitat and ecology: Occurs on sandy soils in arid habitat, where it shelters in burrows. Recorded at elevations of 500–1 000 m a.s.l. This species appears to tolerate some habitat alteration as it has been recorded from free range cattle and game farms. *Habitat*: Savanna

Threats: No significant threats.

Population trend: The global population is considered stable, as this is a widespread and common species. The South African population is also considered to be stable as it occurs in an area dominated by cattle and game farms, with minimal habitat transformation.

Conservation and research recommendations: No recommendations.

Gerrhosaurus auritus, Lephalale, Limpopo province (© L. Verburgt).

Gerrhosaurus auritus, Cuanavale River source, Angola (© W. Conradie).

Family **Gerrhosauridae**

Gerrhosaurus flavigularis Wiegmann, 1828

Yellow-throated Plated Lizard

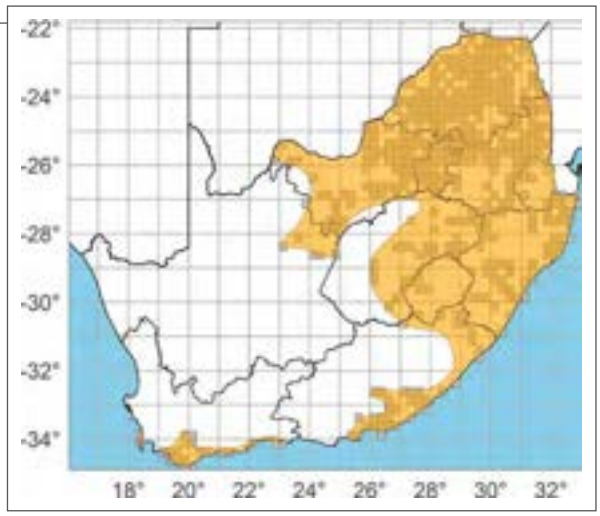
LC – Least Concern (Regional)

Assessor: Bates, M.F.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, with no substantial threats.

Taxonomic notes: A molecular phylogeny indicated that there is some genetic sub-structuring within *G. flavigularis*, which warrants further investigation (Bates et al. 2013). The disjunct subpopulation from the Western Cape province has not been included in any phylogenetic analyses, while individuals from northern South Africa are more closely related to those from East Africa than they are to individuals from more southern areas in South Africa. *Other important names*: none.



Distribution: Widespread in eastern Africa, with an isolated population near Gobabis in Namibia (Branch 1998; Uetz et al. 2020). In the region, the species is widespread across the northeast, extending from the Eastern Cape province through the interior Highveld to North West province and northeast to the

Gerrhosaurus flavigularis, male colouration, Bulembo, Mpumalanga province (© L. Kemp).

Family Gerrhosauridae

Gerrhosaurus flavigularis, female colouration, Tshipise, Limpopo province (© C. Keates).

Lowveld. A disjunct subpopulation in the Western Cape province is potentially isolated from the main population further north. *EOO*: 1 192 000 km^2; *Distribution*: 601 000 km^2.

Countries of occurrence: Botswana, Burundi, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a variety of Grassland, Savanna and Fynbos habitats as well as in low, open coastal forest, sheltering in burrows dug at the base of bushes and under rocks (De Waal 1978; Branch 1998). It has also been recorded from rocky and grassy hillsides and sandy flats (Jacobsen 1989). *Habitat*: Forest, Savanna, Shrubland, Grassland.

Threats: There are no substantial threats to this species.

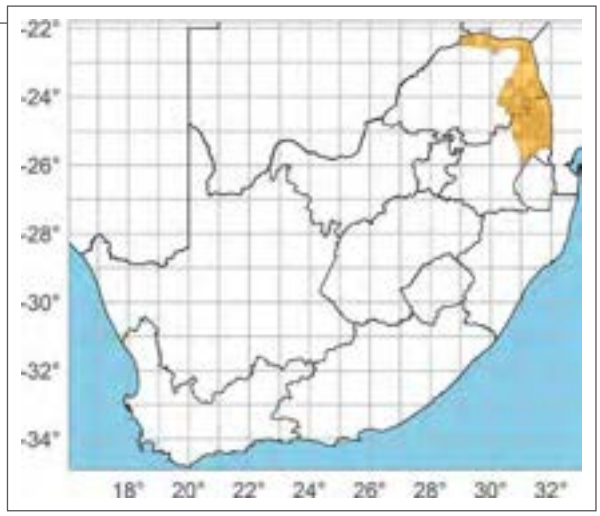
Population trend: Although some parts of the range have been transformed, the extent of habitat transformation is small in relation to the large distribution of this species. It is thus assumed that any local population declines do not pose a threat to the species.

Conservation and research recommendations: No recommendations.

Family **Gerrhosauridae**

Gerrhosaurus intermedius Lönnberg, 1907

Eastern Black-lined Plated Lizard



LC – Least Concern (Regional)

Assessor: Bates, M.F.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although not commonly encountered, this species is fairly widespread and probably occurs naturally at low densities. While some parts of its range are affected by habitat transformation, approximately 40% of its distribution falls within protected areas.

Taxonomic notes: A molecular phylogeny indicated that *G. nigrolineatus sensu stricto* is restricted to Gabon and the lower Congo region in west central Africa, while most other populations currently identified under this name are referable to *G. intermedius* (Bates et al. 2013; but see Spawls et al. 2018). *Gerrhosaurus intermedius* and *G. flavigularis* occur in close proximity and have been confused in the past because the two species are often similar in colour pattern. However, they differ with regards to size and scalation (e.g., in *G. intermedius* the scales under the feet are keeled and spinose and there are usually four supraciliaries; in *G. flavigularis* the scales under the feet are smooth and tubercular and there are usually five supraciliaries) (FitzSimons 1935; Jacobsen 1989; Branch 1998). *Other important names*: *Gerrhosaurus nigrolineatus*.

Distribution: Endemic to eastern sub-Saharan Africa as far north as Kenya (Loveridge 1942; Bates et al. 2013). In South Africa it is restricted to northern and eastern Limpopo and northeastern Mpumalanga provinces. *EOO*: 74 000 km^2; *Distribution*: 45 500 km^2.

Countries of occurrence: Botswana, Burundi, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: In South Africa, it is restricted to low elevation (300–700 m a.s.l.) open Bushveld where it forages in grasses, under bushes and in leaf litter at the base of trees, taking refuge in rodent and mongoose burrows and old termitaria (Jacobsen 1989; Branch 1998). Elsewhere in Africa it occurs in Savanna, Coastal Bush and Grassland at elevations ranging from sea level to about 1 600 m a.s.l. (Loveridge 1942). *Habitat*: Savanna.

Threats: In the region, most of the range is within protected areas. Outside these areas, there is fairly heavy habitat transformation due to agriculture, urbanisation and plantations.

Population trend: The species appears to occur at low densities in South Africa (Jacobsen 1989), but this may be at least partly because it is shy and fast-moving and therefore not easily detected (FitzSimons 1935). The population is inferred to be stable given that most of its range is within large, protected areas.

Conservation and research recommendations: A morphological and phylogenetic evaluation of the *G. nigrolineatus* species complex (*G. nigrolineatus*, *G. intermedius*, *G. auritus*, *G. bulsi* and *G. multilineatus*) is needed.

Gerrhosaurus intermedius, Tshipise, Limpopo province (© R.I. Stander).

Family **Gerrhosauridae**

Gerrhosaurus typicus (Smith, 1837)

Karoo Plated Lizard

South African endemic

LC – Least Concern (Global)

Assessors: Bates, M.F., Tolley, K.A.

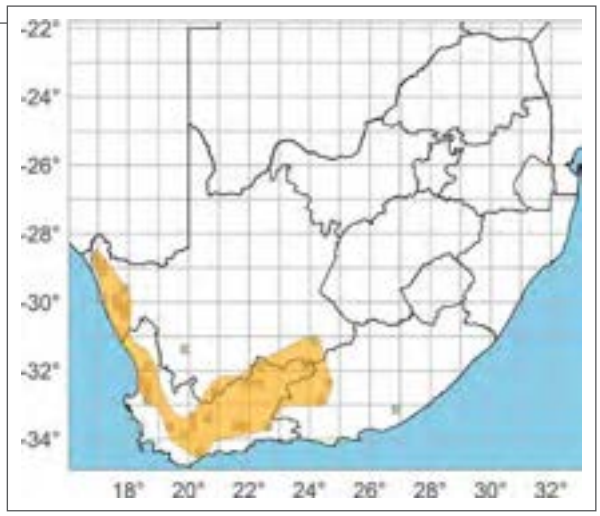
Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Lower Risk/Near threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Assessment rationale: A widespread species that occurs in an area with minimal impacts from anthropogenic habitat transformation.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Distributed along the western and southern margins of South Africa. Although there are few records from Great Karoo and the Eastern Cape province, these regions are poorly sampled (Telford et al. 2022), and it may occur throughout this area. There are several new, isolated records outside the interpreted distribution suggesting that the species may be more widespread and may also occur in southern Namibia (Griffin 2003). *EOO*: 339 000 km^2; *Distribution*: 124 000 km^2.



Country of occurrence: South Africa.

Habitat and ecology: This species occurs on sandy and gravelly soils in the Succulent and Nama-Karoo biomes and Renosterveld vegetation of the Fynbos biome. It uses small burrows at the base of bushes (Loveridge 1942; McLachlan 1988; Branch 1998). The elevational range is from near sea level to about 1 500 m a.s.l. *Habitat*: Shrubland.

Threats: There are no significant threats to this species, as habitat alteration impacts a small portion of the total range.

Population trend: Although there is some habitat modification in parts of the range, the majority of the distribution is not highly impacted. Thus, the widespread distribution and abundance mitigate against the negative effects of local population declines.

Conservation and research recommendations: Additional locality records from undersampled areas, including Namibia, could assist to better assess the extent of the range and the EOO for this species.

Gerrhosaurus typicus, Murraysburg, Western Cape province (© L. Kemp).

Family **Gerrhosauridae**

Matobosaurus validus (Smith, 1849)

Eastern Giant Plated Lizard

LC – Least Concern (Regional)

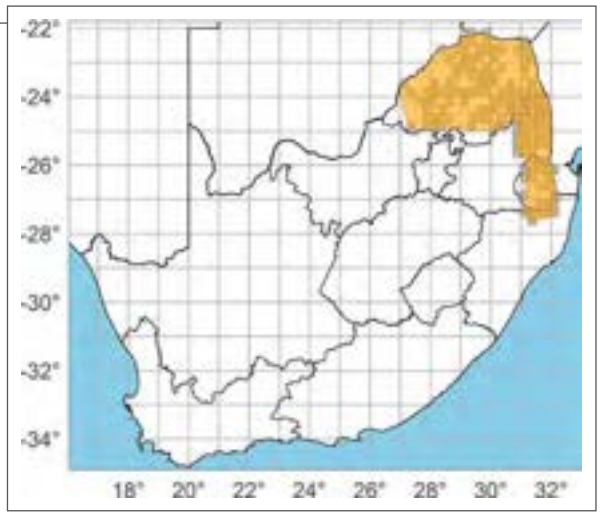
Assessor: Bates, M.F.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and generally common, with no major threats.

Taxonomic notes: No notable issues. *Other important names*: *Gerrhosaurus validus*.

Distribution: Occurs from Zambia and Malawi southwards through Zimbabwe and Mozambique to Botswana, Eswatini and northeastern South Africa (Branch 1998; Bates et al. 2013). In South Africa it occurs from Limpopo province into northern KwaZulu-Natal province. *EOO*: 209 000 km^2; *Distribution*: 152 000 km^2.



Countries of occurrence: Botswana, Eswatini, Malawi, Mozambique, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Occurs almost exclusively in Bushveld habitats at elevations of 300–1 400 m a.s.l. (Jacobsen 1989). Lives communally on rocky outcrops

Matobosaurus validus, Soutpansberg, Limpopo province (© R. van Huyssteen).

Family **Gerrhosauridae**

Matobosaurus validus, aggregation, Makgabeng Plateau, Limpopo province (© M. Burger).

Matobosaurus validus, Hoedspruit, Limpopo province (© C.R. Hundermark).

of various sizes but may forage far from crevices (Jacobsen 1989; Branch 1998). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: Although there is some habitat loss within the range, the extent of habitat transformation is small in relation to the large geographic distribution of this species. It is thus assumed that any local population declines do not pose a threat to the species.

Conservation and research recommendations: No recommendations.

Family **Gerrhosauridae**

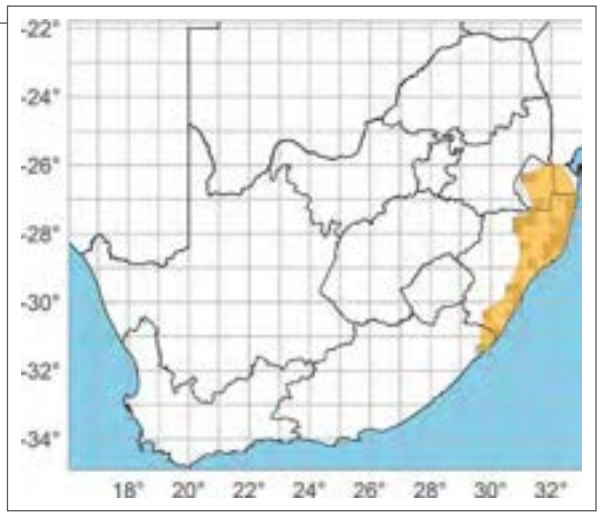
Tetradactylus africanus (Gray, 1838)

Eastern Long-tailed Seps

Regional near-endemic

LC – Least Concern (Global)

Assessor: Bates, M.F.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A fairly widespread and common species with no major threats.

Taxonomic notes: The subspecies *T. a. africanus* and *T. a. fitzsimonsi* (FitzSimons 1943; Branch 1998) were informally treated as full species due to morphological differences (Bates et al. 2014). The identity of a *T. africanus* specimen collected in 1919 from Witsieshoek (or Witzies Hoek) in the Drakensberg at 1 800 m a.s.l. was confirmed by Bates (1992), but no additional specimens have been collected within 200 km of this site, or in similar high-elevation habitat (e.g., De Waal 1978; Bourquin 2004), so this record is viewed with scepticism. *Other important names*: none.

Distribution: Occurs in Eswatini and eastern South Africa (Bourquin 2004) and marginally into southern Mozambique (Bates 2014d). In South Africa, it is distributed along the eastern margin, from northern KwaZulu-Natal province to the northern Eastern Cape province. The record from the Drakensberg remains an anomaly and is not included within the EOO estimate for this species. *EOO*: 88 100 km^2; *Distribution*: 64 800 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa.

Habitat and ecology: Occurs in Grasslands and Woodlands (Bourquin 2004) from sea level to 1 200 m a.s.l. Has been recorded from sandy substrates near the coast and also on the edges of forests and plantations (Bruton & Haacke 1980). *Habitat*: Savanna, Grassland.

Threats: Although there are no significant threats to this species, there is habitat alteration in some parts of the range from urbanisation and agriculture (e.g., sugarcane and crops) and silviculture (Rouget et al. 2006). Because the species is widespread, these threats are considered to have minimal impact at present.

Population trend: There is some habitat modification in parts of the range, but the majority of the distribution is not highly impacted. The widespread distribution and abundance of the species mitigate against the negative effects of local population declines.

Conservation and research recommendations: The validity of the specific status of *T. africanus* and *T. fitzsimonsi* should be assessed using a phylogenetic analysis.

Tetradactylus africanus, Mkambati Nature Reserve, Eastern Cape province (© W. Conradie).

Tetradactylus africanus, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Family **Gerrhosauridae**

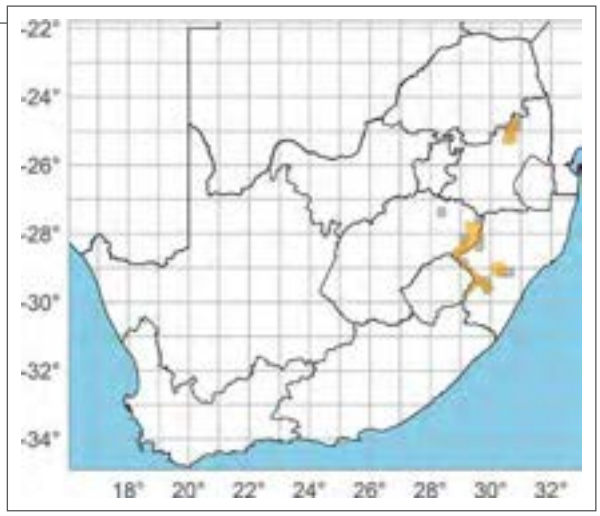
Tetradactylus breyeri Roux, 1907

Breyer's Long-tailed Seps

South African endemic

NT – Near Threatened C2a(i) (Global)

Assessors: Alexander, G.J., Tolley, K.A., Bates, M.F., Weeber, J.



Previous Red List categories:

2019: Near Threatened (Global IUCN assessment).
2018: Least Concern (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).
1996: Vulnerable (Global IUCN assessment).
1994: Vulnerable (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: The geographic distribution of this species consists of widely dispersed and disjunct subpopulations. The range has been heavily impacted by habitat transformation due to agriculture and afforestation, and in some parts, urbanisation. The historical EOO is presumed to have been relatively large (± 89 000 km^2), but only two records have been collected from the KwaZulu-Natal Midlands in the last 50 years (both on iNaturalist: 67245179, 74744682), and none from the central Drakensberg. This could indicate the EOO has declined substantially, to about 65 000 km^2, but this requires verification. The loss of these subpopulations could have resulted

Tetradactylus breyeri, Memel, Free State province (© D.W. Pietersen).

in a reduction in EOO of ± 30% in the last 50 years. Given that the occurrence is patchy, and the extent and quality of suitable habitat has decreased significantly, this species is suspected to be in decline. Despite intensive herpetological activity in the general area, there have only been 21 verified records with 14 of these in the last 50 years and only seven within the last 20 years. A precautionary approach is taken, and this species is assessed as Near Threatened under criterion C because there may be as few as 10 000 individuals remaining.

Taxonomic notes: The taxonomic status of an outlier specimen from the Free State province was originally in doubt (De Waal 1978) but is currently considered to be *T. breyeri* (Bates 1996c). Given this record is isolated by 120 km, confirmation of its occurrence and possibly evaluation in a molecular phylogenetic framework is needed. *Other important names*: none.

Distribution: Has a patchy distribution in high-elevation mountainous regions of northeastern South Africa. The combined distribution size of the subpopulations is approximately 13 100 km^2 and the lack of recent records for some subpopulations could indicate the range has contracted. Just over 20 verified records exist for this species, with 14 of these in the last 50 years and only seven within the last 20 years. *EOO*: 65 000 km^2; *Distribution*: 13 100 km^2.

Country of occurrence: South Africa.

Population trend: The scarcity of recent records could indicate the population is in decline due to high levels of habitat transformation.

Habitat and ecology: Occurs in Montane and Highveld Grasslands at elevations between 1 400–2 000 m a.s.l. (Bates 1996c). Shelters under rocks and other suitable cover, or in moribund termitaria (Jacobsen 1989). *Habitat*: Grassland.

Threats: This species is impacted by transformation of land for agriculture (northern Free State province), afforestation (central KwaZulu-Natal and northern Mpumalanga provinces), overgrazing and urbanisation (Jacobsen 1989; Bates 1996c). Occurrence may be patchy, and the species appears to be intolerant of transformed landscapes, and therefore vulnerable to land cover change.

Conservation and research recommendations: The species has been recorded from some protected areas, but it is known from very few records. A better estimate of its distribution, based on focused surveys, is a first step to assessing whether the threats are having an impact on the species, and the extent of declines. In particular, there is a need for targeted surveys at historical sites where no recent records have been documented.

Family **Gerrhosauridae**

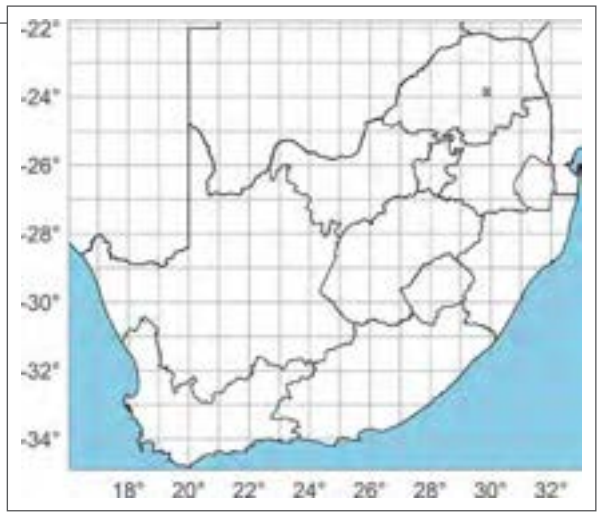
Tetradactylus eastwoodae Methuen & Hewitt, 1913

Eastwood's Long-tailed Seps

South African endemic

■ EX – Extinct (Global)

Assessors: Bates, M.F., Jacobsen, N.



Previous Red List categories:
2018: Extinct (Global IUCN assessment).
2017: Extinct (Global IUCN assessment).
2014: Extinct (SARCA).
1996: Extinct (Global IUCN assessment).
1994: Extinct (Global IUCN assessment).

Assessment rationale: No new records of this species have been made in over 90 years. In the 1980s there were several unsuccessful searches for *Tetradactylus eastwoodae* using arrays of drift fences, pitfall and funnel traps, as well as active searching. Surveys were conducted in the last remaining patches of open Grassland in the Haenertsburg area (Jacobsen 1988c, 1989), e.g., in a small, now degraded area close to a stream between Woodbush Forest and Haenertsburg (possibly where one of the two recorded specimens was collected), as well as an open area of Grassland and shrubby vegetation adjacent to a forest that had not been burnt for about 20 years. In April 2008, a ten-day survey was conducted in Grasslands in the Woodbush–Haenertsburg area using both active searching and drift fence trapping in a concerted but unsuccessful attempt to rediscover this species (Bates & Jacobsen 2018).

Taxonomic notes: This species is known from only two specimens, the holotype collected by E.A. Eastwood in November 1911, and another specimen collected by Vincent A. Wager in December 1928. *Other important names*: none.

Distribution: This species occurred in the Woodbush–Haenertsburg area in Limpopo province, South Africa.

Tetradactylus eastwoodae, Woodbush, Limpopo province (© Ditsong NSCF).

The type locality is 'the Woodbush (Zoutpansberg District)' (Hewitt & Methuen 1913), but much of the Woodbush area is now under plantations (Jacobsen 1988c, 1989). The type locality has been restricted to the farm Broedersdrift 958LS (Bates & Jacobsen 2014).

Country of occurrence: South Africa (Extinct).

Habitat and ecology: Given the ecology of congeners, this species is presumed to have occurred in open Montane Grassland. Historical photographs (Wongtschowski 1990) show that at the time the holotype was collected the area was open Grassland. If a population still persists, it will most likely occur in Grassland remnants in the Woodbush, Haenertsburg or Wolkberg areas. The area of the type locality as well as much of the surrounding area was extensively transformed for silviculture in about 1950. *Habitat*: Grassland.

Threats: The habitat of this species has been largely destroyed by afforestation, agriculture and associated infrastructure. Too frequent fires in Grassland has probably contributed to the demise of this species.

Population trend: Not applicable.

Conservation and research recommendations: Although considered Extinct, additional targeted surveys of habitat fragments in remaining Grassland in the Woodbush, Haenertsburg and Wolkberg areas should be conducted to increase confidence in this assessment. The Woodbush Granite Grassland in which this species probably occurred is not under formal protection and is considered Critically Endangered habitat type (Mucina et al. 2006). Formal protection of the remaining Grassland fragments would be essential, should any surviving populations be found.

Family **Gerrhosauridae**

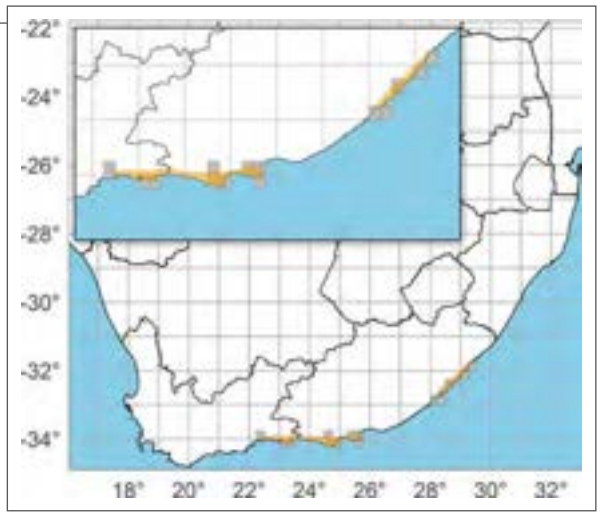
Tetradactylus fitzsimonsi Hewitt, 1915

FitzSimons' Long-tailed Seps

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Tolley, K.A., Weeber, J., Pietersen, D.W., Alexander, G.J.



Previous Red List categories:
2018: Vulnerable (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: There has been a decline in quality of habitat in the range of this species, and given that there are very few recent records, there may be little habitat connectivity across the distribution. Due to its specialised lifestyle as a grass-swimmer, it is unlikely to tolerate habitat alteration and is probably fragmented into multiple small subpopulations. Despite these impacts and threats, the species has a large EOO, which mitigates against an elevated extinction risk and new records from eastern areas have increased the estimates of EOO substantially. While previously assessed as Vulnerable, these new records extend the EOO to over 52 000 km^2 which reduces the extinction risk considerably, and therefore this species has been assessed as Least Concern.

Taxonomic notes: The subspecies *T. a. fitzsimonsi* and *T. a. africanus* (FitzSimons 1943; Branch 1998) were informally treated as full species due to morphological differences (Bates et al. 2014). New records from Hluleka Nature Reserve, Haga-Haga,

Tetradactylus fitzsimonsi, Hluleka Nature Reserve, Eastern Cape province (© W. Conradie).

Lubanzi and Mazeppa Bay in the Eastern Cape province are referable to *T. fitzsimonsi* (Venter & Conradie 2015; ReptileMap: 155833; iNaturalist: 36283288, 8681502). *Other important names*: *Tetradactylus africanus fitzsimonsi*.

Distribution: This species is distributed along a narrow coastal belt rimming the southern and eastern margin of the Eastern and Western Cape provinces, South Africa. There appear to be two subpopulations (southern and eastern) that are separated by over 300 km. Given that the eastern subpopulation was recently discovered (Venter & Conradie 2015), it is possible that this lizard also occurs in the gap between the southern and eastern subpopulations but has not yet been recorded there. *EOO*: 52 140 km^2; *Distribution*: 5 850 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in Fynbos and Grassland vegetation. The elongate body and limb reduction suggests it is a grass-swimmer. *Habitat*: Shrubland.

Population information: Within the southern extent of the distribution, there are only 17 records, and only four of these have been made in the last decade, the most recent from Knysna in 2022. There are, however, seven new records from four localities in the eastern portion of the distribution, which has extended the species' distribution considerably. There are few records of this species as it is naturally rare and difficult to find. It is unlikely that more than half the individuals occur in subpopulations with little connectivity, so the species is not considered severely fragmented.

Threats: Historically, land conversion for agriculture and plantations most likely caused population declines in the southern part of the distribution. However, the remaining habitat in the southern area is reasonably intact and much of the Fynbos habitat is under some form of protection. In the northern part of the range, present day habitat transformation (overgrazing and agriculture) is likely causing a decline in quality and extent.

Conservation and research: There are very few records of this species, so more comprehensive survey data might allow for an improved assessment of the distribution and threats. Surveys in the 300 km gap between the two subpopulations might allow for a better assessment of the distribution.

Family **Gerrhosauridae**

Tetradactylus seps (Linnaeus, 1758)

Short-legged Seps

South African endemic

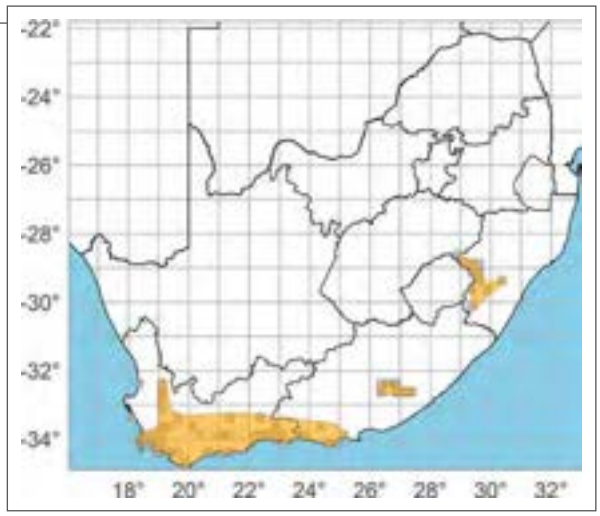
LC – Least Concern (Global)

Assessors: Tolley, K.A., Conradie, W., Alexander, G.J., Bates, M.F., Weeber, J., Pietersen, D.W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread and can be locally abundant, with no significant threats across most of its range.

Taxonomic notes: *Tetradactylus laevicauda* (Hewitt 1915) was described from the KwaZulu-Natal Drakensberg region of South Africa but has been treated as a subspecies (FitzSimons 1943) and a junior synonym (Branch 1990b) of *T. seps*. Current distribution records show a large geographic gap in the Eastern Cape province, which was thought to indicate subpopulations in the Cape area and KwaZulu-Natal province. Preliminary phylogenetic analyses suggest that there are no notable genetic differences between the Western Cape, Eastern Cape and KwaZulu-Natal subpopulations. However, there appears to be some genetic structure within the southern subpopulation (K.A Tolley and W. Conradie, unpubl. data 2020). *Other important names*: *Tetradactylus laevicauda*.



Distribution: There are three subpopulations in South Africa – in KwaZulu-Natal province, central Eastern Cape province and along the southern margin of the country in the lowlands and mountains, with additional scattered records to the west. *EOO*: 404 000 km²; *Distribution*: 75 200 km².

Country of occurrence: South Africa.

Habitat and ecology: This species occurs in many different habitat types including marshy areas, open clearings, grassy flats and coastal vegetation. It has been recorded from Forest, Fynbos and Montane Grasslands and has a large elevational range from sea level to about 1 800 m a.s.l. *Habitat*: Forest, Shrubland, Grassland.

Threats: There are no significant threats.

Population trend: Although there has been some habitat modification in parts of the range, most of the distribution is not greatly impacted. The widespread distribution and abundance mitigate against the negative effects of local population declines.

Conservation and research recommendations: A comprehensive phylogenetic analysis could assist to resolve the status of *T. laevicauda*, and to assess whether there could be cryptic species within this taxon.

Tetradactylus seps, George, Western Cape province (© L. Kemp).

Family **Gerrhosauridae**

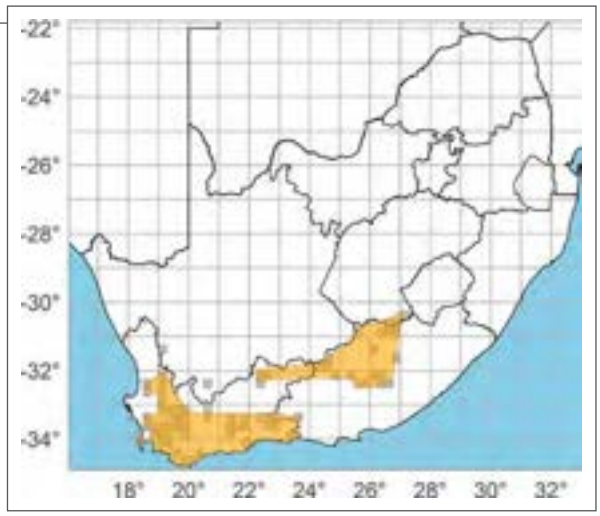
Tetradactylus tetradactylus (Daudin, 1802)

Cape Long-tailed Seps

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Tolley, K.A., Alexander, G.J., Bates, M.F., Weeber, J., Pietersen, D.W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread species with no major threats.

Taxonomic notes: *Tetradactylus bilineatus* has been treated as a subspecies (Loveridge 1942; FitzSimons 1943) and as a junior synonym (Branch 1990b) of *T. tetradactylus*. A preliminary phylogeny suggests that *T. bilineatus* from along the Great Escarpment and eastern Karoo is genetically differentiated at the species level (W. Conradie, unpubl. data 2020). *Other important names*: *Tetradactylus bilineatus*.

Distribution: Occurs in the southern portion of South Africa as two subpopulations – from the southwestern coastal areas eastward through the Cape Fold Mountains, and along the Great Escarpment into the Eastern Cape province (possibly as *T. bilineatus*). There are two isolated records from the eastern Great Escarpment that suggest the distribution might be more continuous through that area. *EOO*: 271 000 km²; *Distribution*: 109 000 km².

Country of occurrence: South Africa.

Habitat and ecology: Occurs across several vegetation types including Fynbos and Karoo, in both lowland and mountainous terrain (Branch 1990b). *Habitat*: Shrubland, Grassland.

Threats: There are no significant threats to this species.

Population trend: Although there is some habitat modification in parts of the range, the majority of the distribution is not highly impacted. The widespread distribution and abundance mitigate against the negative effects of local population declines.

Conservation and research recommendations: A taxonomic revision that assesses the status of *T. bilineatus* in a phylogenetic context is needed. Additional records from the Great Escarpment are required to better assess the distribution of the species and the taxonomic placement of subpopulations.

Tetradactylus tetradactylus, Nieu-Bethesda, Eastern Cape province (© T. Ping).

Tetradactylus tetradactylus (bilineatus), Nieu-Bethesda, Eastern Cape province (© L. Kemp).

Family **Scincidae**

Acontias albigularis Conradie, Busschau & Edwards, 2018

White-throated Legless Skink

South African endemic

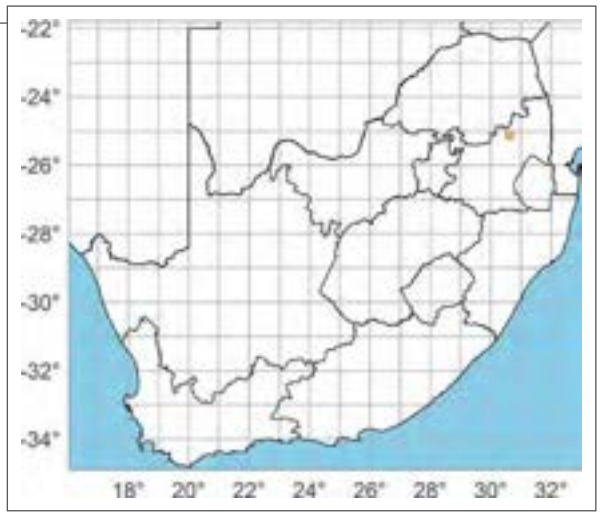
DD – Data Deficient (Global)

Assessor: Conradie, W.

Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).

Assessment rationale: This is a recently described species, which is known from only a few records collected within a few kilometres of each other. The extent of the distribution is not known, but it is probably more widespread than records indicate. Therefore, the EOO could range anywhere from just tens of km² to hundreds of km². Given that there is habitat transformation in the area, but it is unclear if the population is severely fragmented, the threat status could range from Least Concern (if the range is large) to Critically Endangered (if the range is very small). Because the extinction risk cannot be assessed given the present knowledge, this species is considered Data Deficient.

Acontias albigularis, Long Tom Pass, Mpumalanga province (© W. Conradie).



Taxonomic notes: This species was recently split from *Acontias breviceps* Essex, 1925 by Conradie et al. (2018). *Other important names*: *Acontias breviceps*.

Distribution: This species has been recorded from Mpumalanga province, South Africa, but the limits to its overall distribution are not known. To date, there are only a few records from the escarpment around Long Tom Pass in Mpumalanga province, but the distribution could be much larger than what is represented by the few data points. Its overall distribution and EOO cannot be estimated with any confidence and therefore have not been included.

Country of occurrence: South Africa.

Habitat and ecology: Recorded from Montane Grasslands under large flat rocks on the Mpumalanga escarpment at an elevation above 2 000 m a.s.l. *Habitat*: Grassland.

Threats: Threats to this species are unknown, but afforestation may represent a significant threat given that this type of habitat transformation is widespread in the overall area.

Population trend: Unknown.

Conservation and research recommendations: Better information on the extent of distribution and the potential threats to this species are needed to carry out an assessment.

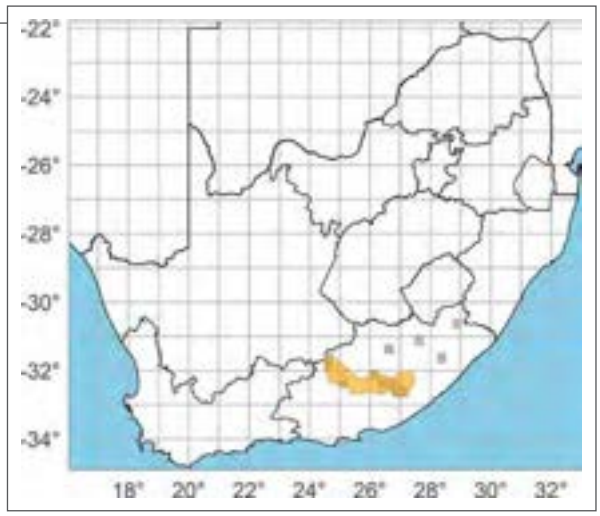
Acontias breviceps Essex, 1925

Short-headed Legless Skink

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Relatively widespread and locally abundant with no significant threats.

Taxonomic notes: A phylogenetic analysis shows that the sister taxon to the two northern subpopulations is *Acontias gracilicauda*, and not the nominal Eastern Cape form (Busschau et al. 2017). The nominal form is restricted to the Eastern Cape province and the northern populations have been described as two species, viz., *A. albigularis* and *A. wakkerstroomensis* (Conradie et al. 2018). *Other important names*: none.

Distribution: Occurs across the central montane regions of the Eastern Cape province, South Africa (Conradie et al. 2018). There are a number of outlying records that are valid, but it is unclear how they are spatially linked to the main AOO. *EOO*: 63 000 km^2; *Distribution*: 16 900 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A fossorial species that occurs in relatively mesic microhabitats beneath logs, stones and debris. *Habitat*: Grassland.

Threats: Although parts of the range have been afforested, that threat is historical and is probably not a continuing impact at present. It may also have some tolerance for transformed habitats.

Population trend: Has a fairly large geographic range in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Acontias breviceps, Hogsback, Eastern Cape province (© C. Keates).

Family **Scincidae**

Acontias cregoi (Boulenger, 1903)

Cregoi's Legless Skink

South African endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This is a relatively widespread and common species with no major threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: This species occurs in northeastern South Africa (Branch 1998) from Kruger National Park westwards to the Makgabeng Plateau in Limpopo province. *EOO*: 25 700 km²; *Distribution*: 18 800 km².

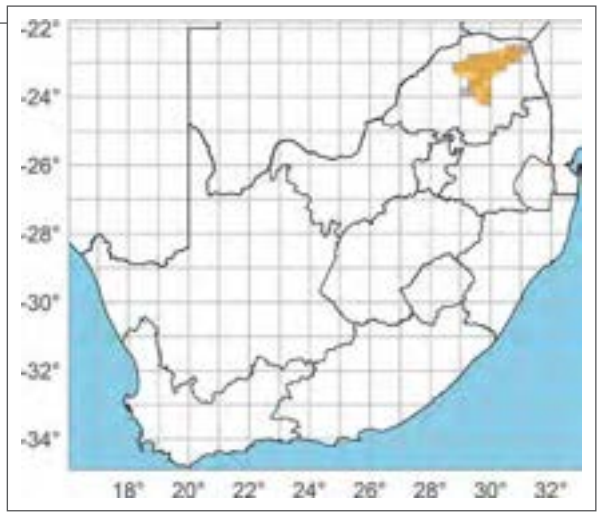
Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in rocky soils especially on hillsides at elevations of 650–1 700 m a.s.l. (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.



Acontias cregoi, Punda Maria, Kruger National Park, Limpopo province (© R.I. Stander).

Acontias cregoi, Ga Matlala, Limpopo province (© G.K. Nicolau).

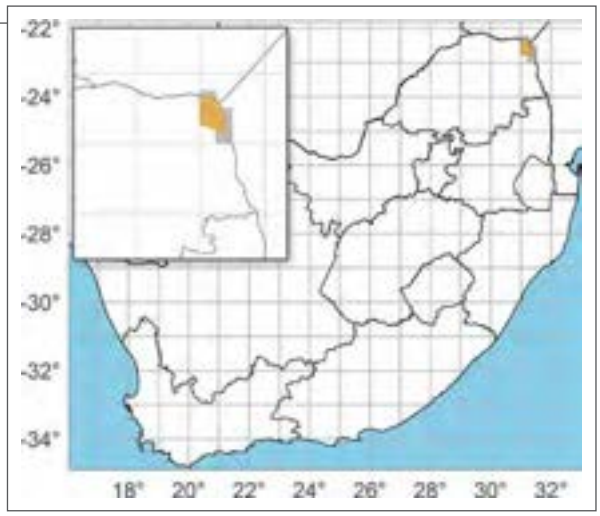
Acontias fitzsimonsi (Broadley, 1968)

FitzSimons' Legless Skink

South African endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment) as *Acontias aurantiacus fitzsimonsi*.
2014: Least Concern (SARCA).

Assessment rationale: Although the distribution is relatively small, all of the known records occur within a protected area (Kruger National Park) where there are no known threats.

Taxonomic notes: Pietersen et al. (2018) recently elevated *A. fitzsimonsi* to specific status. *Other important names*: *Typhlosaurus aurantiacus fitzsimonsi*.

Distribution: Currently thought to be endemic to South Africa, found only within northern Kruger National Park in northeastern Limpopo province (Jacobsen 1989; Pietersen et al. 2018). It is possible that it also occurs in adjacent Mozambique and/or Zimbabwe, although there are no records from there at present. *EOO*: 1 750 km^2; *Distribution*: 1 730 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in deep sandy soils in Savanna bushveld, at about 400 m a.s.l. elevation (Jacobsen 1989). *Habitat*: Savanna

Threats: There are no major threats.

Population trend: The population is considered to be stable given that the known distribution is entirely within a large, protected area (Kruger National Park).

Conservation and research recommendations: No recommendations.

Acontias fitzsimonsi, Kruger National Park, Limpopo province (© D.W. Pietersen).

Acontias fitzsimonsi, Kruger National Park, Limpopo province (© D.W. Pietersen).

Family **Scincidae**

Acontias gariepensis (FitzSimons, 1941)

Gariep Legless Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

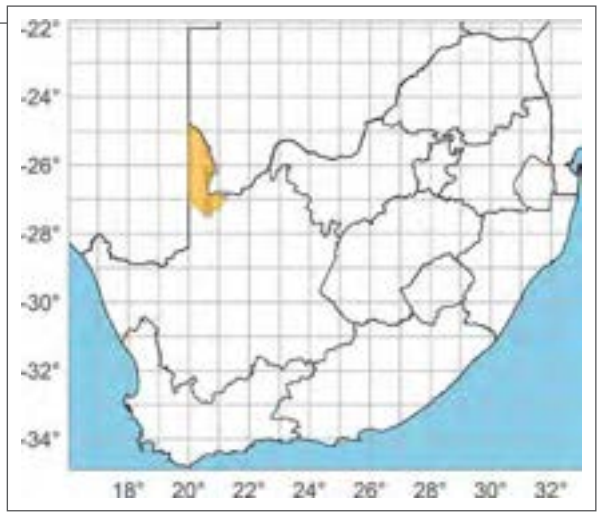
Assessment rationale: Common and not subject to any major threats. At least half of its distribution is under protection within the Kgalagadi Transfrontier Park.

Taxonomic notes: Easily confused with *A. k. kgalagadi* where it occurs in sympatry in the southern Kalahari. *Other important names*: *Typhlosaurus gariepensis*.

Distribution: Occurs in the duneveld Kalahari region of the Northern Cape province, South Africa, and adjacent southeastern Namibia and southwestern Botswana (Broadley 1968). *EOO*: 23 700 km^2; *Distribution*: 19 500 km^2.

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: Fossorial, occurring on vegetated dune ridges in Kalahari duneveld, from 800 to 1 000 m a.s.l. elevation. *Habitat*: Desert, Savanna.



Threats: There are no substantial threats to this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: No recommendations.

Acontias gariepensis, near Twee Riviere, Northern Cape province (© J. Marais).

Acontias gracilicauda Essex, 1925

Thin-tailed Legless Skink

Regional endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: *Acontias gracilicauda* is widespread and common with no major threats.

Taxonomic notes: The historical records of this species in the Northern Cape province of South Africa (Bauer 2014b) are referable to *A. occidentalis* (Busschau et al. 2017). A potential record from the Swartberg Pass in the Western Cape province (Bauer 2014b) is referable to the *A. meleagris* group (W. Conradie, pers. obs. 2017). *Other important names*: none.

Distribution: Widespread throughout eastern and central South Africa. Extends from south coastal Eastern Cape province, into western Lesotho (Broadley & Greer 1969) and northwards as far as Gauteng province. There is an isolated record from central KwaZulu-Natal province and the identification of this specimen (Ditsong National Museum of Natural History) has been confirmed (A. Jordaan, pers. comm. 2020). *EOO*: 405 000 km²; *Distribution*: 306 000 km².

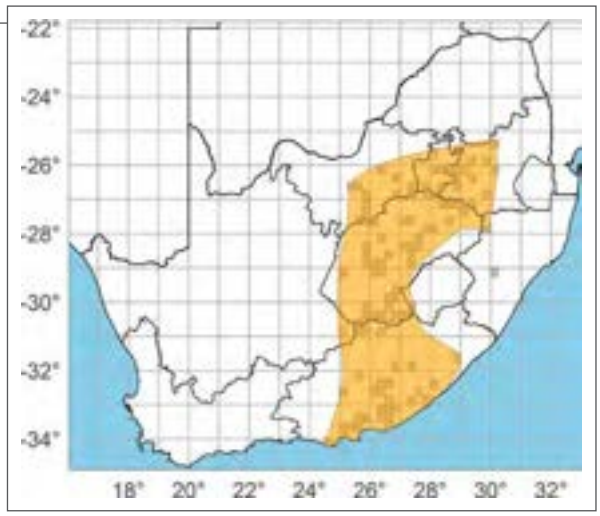
Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: Fossorial, usually occupying moderately mesic soils in open or partly wooded habitats (Branch 1998). *Habitat*: Savanna, Shrubland, Grassland.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.



Acontias gracilicauda, Dullstroom, Mpumalanga province (© D.W. Pietersen).

Acontias gracilicauda, Colesberg, Northern Cape province (© L. Kemp).

Family **Scincidae**

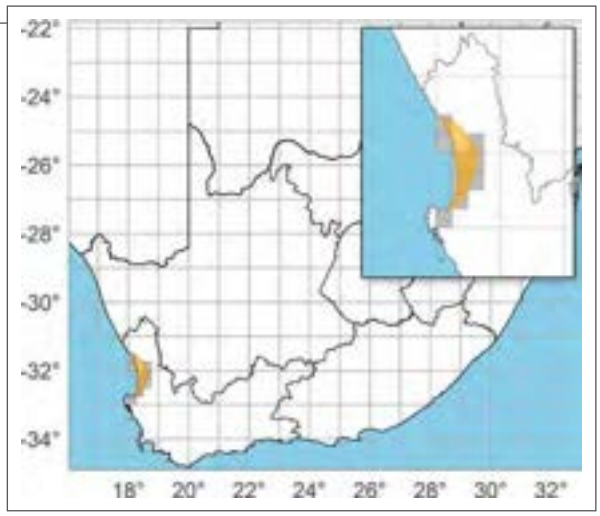
Acontias grayi Boulenger, 1887

Gray's Dwarf Legless Skink

South African endemic

NT – Near Threatened, B1b(iii) (Global)

Assessors: Conradie, W., Weeber, J., Alexander, G.J., Pietersen, D.W., Tolley, K.A., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Reason for recent change: Genuine.

Assessment rationale: This species has a small range within an area that has been heavily transformed in the past. The intact habitat patches make up over 50% of the total range, although these patches range in size from about 0.01 km² to over 800 km². It is not considered severely fragmented as it is suspected that less than half the population occurs as isolated sub-populations. Given the extent of transformation, the ongoing habitat loss and the small range, this species could become threatened in a short period of time if the threats intensify. There is an emerging threat of mining, so a category of Near Threatened is considered appropriate.

Taxonomic notes: Phylogenetic analyses show shallow divergence between *A. tristis*, *A. grayi*, *A. lineatus* and *A. litoralis* (Daniels et al. 2006; Lamb et al. 2010) as well as paraphyly between these taxa (Janse van Vuuren 2009). Furthermore, there are no clear, diagnostic morphological differences among taxa (but see Broadley & Greer 1969), and there are some limited areas of sympatry. This has cast some doubt as to the

Acontias grayi, Graafwater, Western Cape province (© C. & S. Dorse).

current taxonomic arrangement. *Other important names*: *Microacontias grayi*.

Distribution: This species has a small distribution in the central, coastal region of the Western Cape province, South Africa (Broadley & Greer 1969). *EOO*: 5 040 km^2; *Distribution*: 3 100 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in sandy soils in mesic conditions (Branch 1998). All precise records are from untransformed habitats, possibly suggesting that this skink does not tolerate habitat alteration. Although not specifically quantified for *A. grayi*, *Acontias* spp. can be relatively abundant in suitable habitat (e.g., *A. litoralis*: Mashinini et al. 2011). *Habitat*: Shrubland.

Threats: At least half of the range is severely transformed by agriculture, and the rate of habitat transformation in the area substantially increased between 1990 and 2014 (Skowno et al. 2019). Given there are no records of this species from agricultural landscapes, and agriculture is widespread, habitat transformation is likely a threat. In addition, there have been several new strip-mining applications that are in various stages of approval, and this could heavily impact the coastal margin and inland (https://www.protectthewestcoast.org/). An increase in mining could pose a threat to this species in the immediate future.

Population trend: Nearly half of the habitat is transformed and heavily fragmented, and this transformation is ongoing (Skowno et al. 2019). Given that this species probably does not tolerate habitat transformation, the population may have declined over recent decades. In addition, the metapopulation could lack connectivity and the continuation of sufficient gene flow could be an issue into the future.

Conservation and research recommendations: The taxonomy of the *A. lineatus* species complex should be investigated in a phylogenetic framework with comprehensive sampling. Given the morphological similarities in the group, accurate identifications are also needed. To assess whether *A. grayi* is tolerant of transformed landscapes, surveys in natural, rehabilitated and agricultural habitats are needed. Research on the extent of emerging pressures is required to assess population trends, i.e., the expanding mining footprint should be monitored to assess further declines in habitat quality and extent.

Family **Scincidae**

Acontias kgalagadi Lamb, Biswas & Bauer, 2010

Striped Blind Legless Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

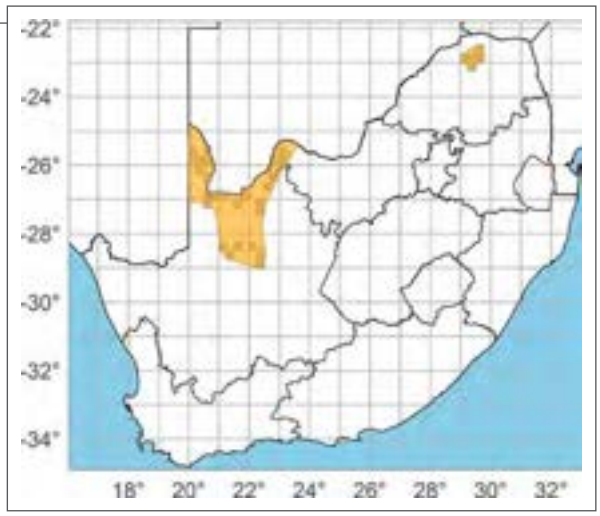
Subspecies assessed:
2014: *Acontias kgalagadi kgalagadi* – Least Concern (SARCA).
2014: *Acontias kgalagadi subtaeniatus* – Data Deficient (SARCA).

Subspecies included under this assessment:
- *Acontias kgalagadi kgalagadi* Lamb, Biswas & Bauer, 2010.
- *Acontias kgalagadi subtaeniatus* Broadley, 1968.

Assessment rationale: Widespread and common in suitable habitat with no major threats.

Taxonomic notes: *Acontias kgalagadi* has a complicated taxonomic history, but it is now considered to be comprised of two morphologically and geographically separated subspecies (*A. k. kgalagadi* and *A. k. subtaeniatus*; Lamb et al. 2010), which may be distinct species. *Other important names*: *Typhlosaurus lineatus lineatus*; *Typhlosaurus lineatus subtaeniatus*.

Distribution: Occurs across much of southern Africa extending from South Africa through most of Botswana, adjacent parts of Namibia and southeastern Angola (Broadley 1968; Conradie & Bourquin 2013). In South Africa, the typical form is restricted to the Kalahari region, while the subspecies *A. k. subtaeniatus* occurs in northern Limpopo province. Records of this species from the contact zone with *A. lineatus* require verification. *EOO*: 316 000 km²; *Distribution*: 65 300 km².



Countries of occurrence: Angola, Botswana, Namibia, South Africa.

Habitat and ecology: A fossorial species that occurs in deep sandy soils in Kalahari dunes and open Savanna, sometimes found under rotting logs, rocks or other surface debris. *Habitat*: Desert, Savanna.

Threats: No significant threats.

Population trend: The population is considered stable as it is common in an area that has little habitat transformation.

Conservation and research recommendations: The taxonomic status of the two subspecies requires assessment.

Acontias kgalagadi kgalagadi, Van Zylsrus, Northern Cape province (© G.K. Nicolau).

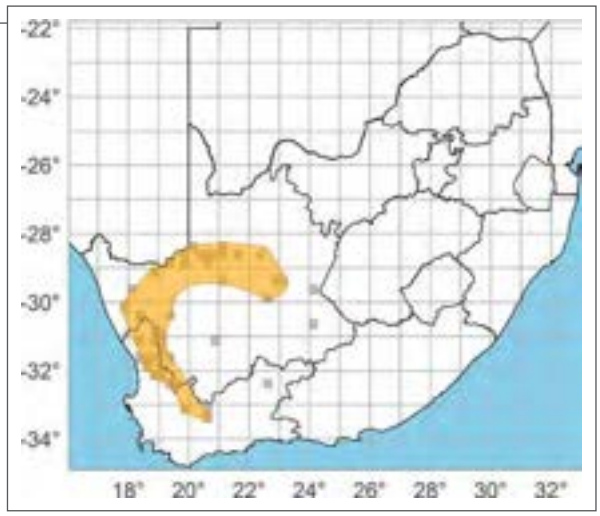
Acontias kgalagadi subtaeniatus, Goro, Limpopo province (© R.I. Stander).

Acontias lineatus Peters, 1879

Striped Legless Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: Phylogenetic analyses show shallow divergence between *A. tristis*, *A. grayi*, *A. lineatus* and *A. litoralis* (Daniels et al. 2006; Lamb et al. 2010) as well as paraphyly between these taxa (Janse van Vuuren 2009). Furthermore, there are no clear, diagnostic morphological differences among taxa (but see Broadley & Greer 1969), and there are some limited areas of sympatry. This has cast some doubt as to the current taxonomic arrangement. *Other important names*: *Microacontias lineatus*.

Distribution: Occurs in southern Namibia and across most of the Northern Cape province, South Africa, extending peripherally into the Western Cape province (Broadley & Greer 1969) with scattered records in the Karoo region. There is a contact zone between this species and *A. k. kgalagadi*, which occurs to the north, and these records require validation. *EOO*: 250 000 km^2; *Distribution*: 101 000 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Fossorial, usually occurring in association with plant roots or surface debris (Branch 1998). Inhabits sandy soils in a wide variety of habitats. *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: More comprehensive information on the distribution is needed especially across the Karoo region, and whether the apparent overlap with *A. k. kgalagadi* is a result of misidentifications between these taxa. Furthermore, an investigation into the taxonomic status of the taxa in the *Acontias lineatus* species complex is required.

Acontias lineatus, Springbok, Northern Cape province (© M. Petford).

Family **Scincidae**

Acontias lineicauda Hewitt, 1937

Algoa Legless Skink

South African endemic

LC – Least Concern (Global)

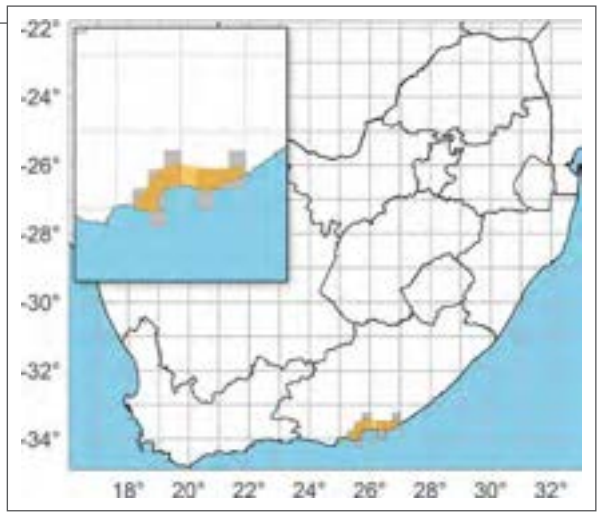
Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although there is some habitat alteration within the geographic distribution, *Acontias lineicauda* is abundant across most of its range and tolerant of low-levels of habitat alteration.

Taxonomic notes: *Acontias lineicauda*, *A. orientalis* and *A. meleagris* have complex taxonomic histories (Broadley & Greer 1969; Daniels et al. 2002, 2005, 2006, 2009), having been treated as subspecies of *A. meleagris* and subsequently as full species (Lamb et al. 2010). The taxonomy is still problematic due to confusion around colour morphs that do not correspond to the species-level phylogenetic results, paraphyly of *A. meleagris* (Engelbrecht et al. 2013) and a lack of topotypic material for *A. lineicauda* (from the locality Dunbrody; Hewitt 1937b, 1938). *Other important names*: *Acontias meleagris orientalis* 'lineicauda morph'.

Acontias lineicauda, Cape St Francis, Eastern Cape province (© D.W. Pietersen).



Distribution: Occurs in the Algoa Bay region of the Eastern Cape province, South Africa from just east of Gqeberha, northeastwards following the coast to the East London area. Records more than about 40 km inland (Bauer 2014c) are considered erroneous and refer to *A. orientalis*. *EOO*: 6 290 km^2; *Distribution*: 4 470 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in coastal areas and alluvial soils in inland valleys usually in relatively dry situations (Broadley & Greer 1969) from sea level to at least 500 m a.s.l., but chiefly below 300 m a.s.l. *Habitat*: Shrubland, Grassland.

Threats: There are no major threats to this species, although there are some localised impacts from mining and agricultural activities.

Population trend: The population size is assumed to be stable because the extent of habitat transformation is small in relation to the range of this species.

Conservation and research recommendations: The taxonomic validity of the members of the *Acontias meleagris* species complex should be objectively re-evaluated.

Family **Scincidae**

Acontias litoralis Broadley & Greer, 1969

Coastal Legless Skink

South African endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.

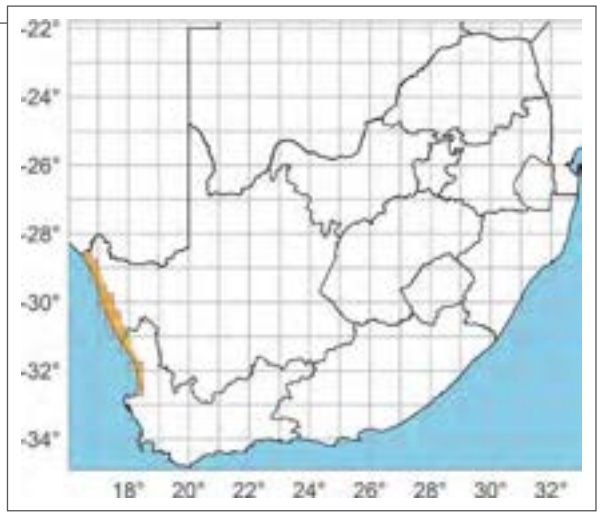
Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a moderate range size, is abundant throughout its distribution and not subject to major threats.

Taxonomic notes: Phylogenetic analyses show shallow divergence between *A. tristis*, *A. grayi*, *A. lineatus* and *A. litoralis* (Daniels et al. 2006; Lamb et al. 2010) as well as paraphyly between these taxa (Janse van Vuuren 2009). Furthermore, there are no clear, diagnostic morphological differences among taxa (but see Broadley & Greer 1969), and there are some limited areas of sympatry. This has cast some doubt as to the current taxonomic arrangement. *Other important names*: *Microacontias litoralis*.

Distribution: *Acontias litoralis* is distributed in the western coastal regions of the Northern and Western Cape province, South Africa from the coast to about 30 km inland. *EOO*: 16 350 km²; *Distribution*: 10 700 km².

Country of occurrence: South Africa.



Habitat and ecology: A fossorial species that occurs in sandy soils in sparsely vegetated coastal dunes, from sea level to approximately 100 m a.s.l. elevation (Mashinini 2004). They are most abundant under leaf litter at the base of *Ruschia crassisepala* bushes, averaging 22 individuals per hectare (Mashinini et al. 2011). *Habitat*: Shrubland.

Threats: No major threats, although the southern part of the range has been heavily transformed by agriculture (Skowno et al. 2019).

Population trend: This species is not considered to be in decline. It is abundant in suitable habitat throughout its range (Mashinini et al. 2011).

Conservation and research recommendations: An investigation into the taxonomic status of the taxa in the *Acontias lineatus* species complex is required.

Acontias litoralis, Koingnaas, Northern Cape province (© L. Kemp).

Acontias litoralis, McDougall's Bay, Port Nolloth, Northern Cape province (T. Ping).

Family **Scincidae**

Acontias meleagris (Linnaeus, 1758)

Cape Legless Skink

South African endemic

LC – Least Concern (Global)

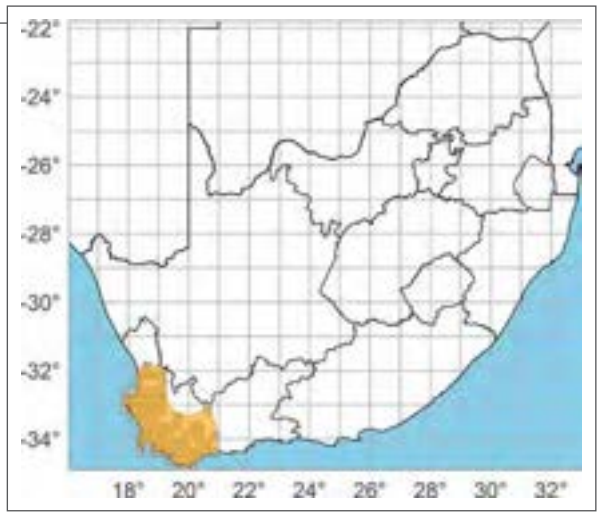
Assessors: Conradie, W., Bauer, A.M.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread, common and not subject to any major threats.

Taxonomic notes: *Acontias meleagris*, *A. orientalis* and *A. lineicauda* have complex taxonomic histories (Broadley & Greer 1969; Daniels et al. 2002, 2005, 2006, 2009), having been treated as subspecies of *A. meleagris* and subsequently as full species (Lamb et al. 2010). The taxonomy is still problematic due to confusion around colour morphs that do not correspond to the species-level phylogenetic results, paraphyly of *A. meleagris* (Engelbrecht et al. 2013) and a lack of topotypic material for *A. lineicauda* (from the locality Dunbrody; Hewitt 1937b). In this assessment, the taxonomy recommended by Engelbrecht et al. (2013) has been followed. There is a potential contact zone between *A. meleagris* and *A. orientalis* in the Breede River Valley (Engelbrecht et al. 2013). Records from the eastern parts of the Western and Eastern Cape provinces are now referred to *Acontias orientalis* (Fig. 5 in Engelbrecht et al. 2013). *Other important names*: none.

Distribution: Occurs throughout most of the south-western parts of the Western Cape province, South Africa (Engelbrecht et al. 2013). *EOO*: 65 000 km²; *Distribution*: 48 100 km².



Country of occurrence: South Africa.

Habitat and ecology: A fossorial species that occurs in rich coastal soils, and in alluvial soils in inland valleys. *Habitat*: Shrubland, Coastal sand dunes.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The status of populations at the potential contact zone and other out of range records require confirmation. The taxonomic validity of the members of the *Acontias meleagris* species complex should be objectively re-evaluated.

Acontias meleagris, Stellenbosch, Western Cape province (© L. Kemp).

Acontias meleagris, Velddrif, Western Cape province (© T. Ping).

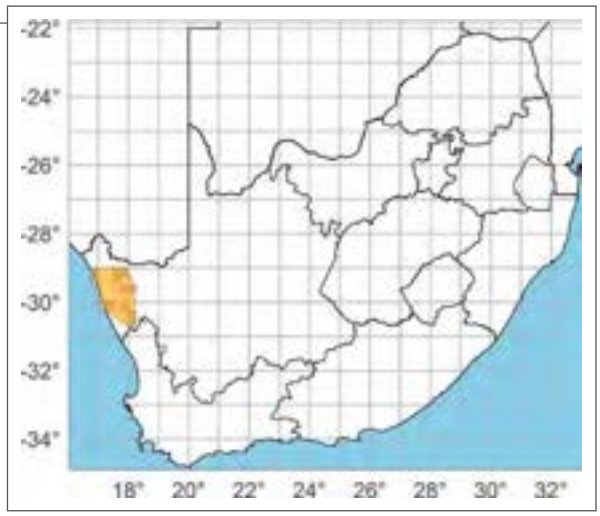
Acontias namaquensis Hewitt, 1938

Namaqualand Legless Skink

South African endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Is fairly widespread and locally abundant with no known significant threats.

Taxonomic notes: No taxonomic issues. *Other important names*: *Acontias gracilicauda namaquensis*.

Distribution: Occurs in the western portion of the Northern Cape province (i.e., Little Namaqualand), South Africa (Broadley & Greer 1969; Branch & Maritz 2010). *EOO*: 28 500 km^2; *Distribution*: 17 400 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in relatively mesic conditions in sandy soils (Branch 1998). *Habitat*: Shrubland.

Threats: No major threats have been identified for this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined.

Conservation and research recommendations: No recommendations.

Acontias namaquensis, Noup, Northern Cape province (© J. Harvey).

Acontias namaquensis, Springbok, Northern Cape province (© T. Ping).

Family **Scincidae**

Acontias occidentalis FitzSimons, 1941

Western Legless Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread, especially outside of South Africa, with no major threats.

Taxonomic notes: Phylogenetic analyses show that records from the Northern Cape and western North West provinces that were previously assigned to *A. gracilicauda* should be assigned to this species complex (Busschau et al. 2017). *Other important names*: *Acontias percivali occidentalis*.

Distribution: Occurs across central southern Africa, into southern Angola (Broadley & Greer 1969). In South Africa, the species is distributed in the north, from Limpopo province west into the Northern Cape province. *EOO*: 324 000 km²; *Distribution*: 179 000 km².

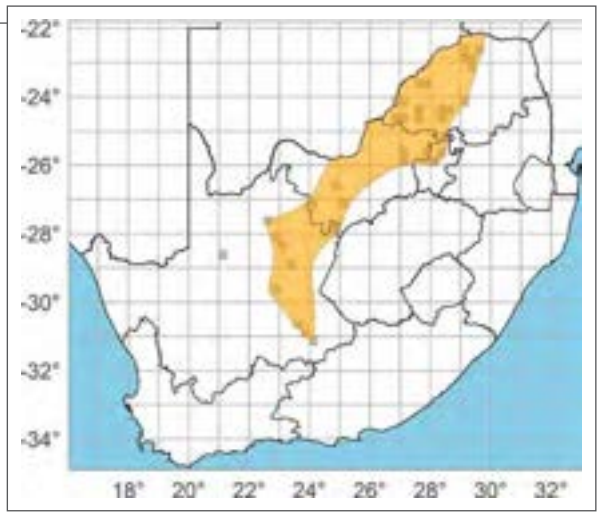
Countries of occurrence: Angola, Botswana, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Fossorial, usually occurring in soil under leaf litter or other debris. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs across some areas that are not impacted by habitat transformation.

Conservation and research recommendations: Additional records from the Northern Cape province would allow for a better assessment of the geographic distribution, particularly with reference to *A. gracilicauda*.



Acontias occidentalis, Alldays, Limpopo province (© R.I. Stander).

Acontias occidentalis, north of Richmond, Northern Cape province (© W. Conradie).

Family **Scincidae**

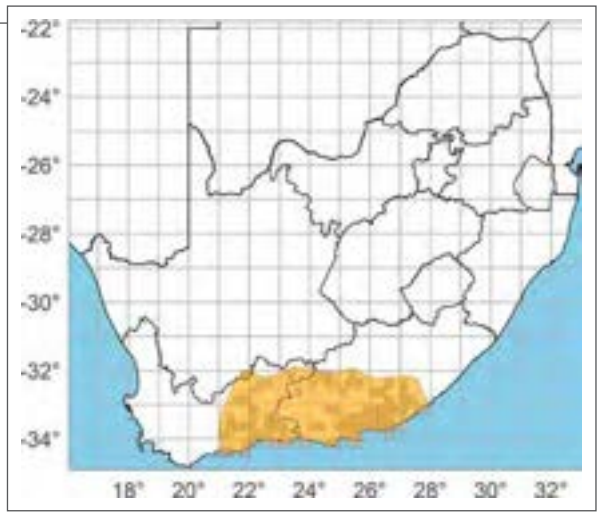
Acontias orientalis Hewitt, 1937

Eastern Cape Legless Skink

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Bauer, A.M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Relatively widespread and common and not subject to major threats.

Taxonomic notes: *Acontias meleagris*, *A. orientalis* and *A. lineicauda* have complex taxonomic histories (Broadley & Greer 1969; Daniels et al. 2002, 2005, 2006, 2009), having been treated as subspecies of *A. meleagris* and subsequently as full species (Lamb et al. 2010). The taxonomy is still problematic due to confusion around colour morphs that do not correspond to the species-level phylogenetic results, paraphyly of *A. meleagris* (Engelbrecht et al. 2013) and a lack of topotypic material for *A. lineicauda* (from Dunbrody; Hewitt 1937b, 1938). *Acontias percivali tasmani* is not distinct from *A. orientalis*, showing low genetic divergence and near complete overlap in morphological characters (Broadley & Greer 1969; Lamb et al. 2010) although they differ in colour. In this assessment, the taxonomy recommended by Engelbrecht et al. (2013) has been followed. *Other important names*: *Acontias meleagris orientalis*; *Acontias percivali tasmani*.

Distribution: Occurs across the Eastern Cape province, South Africa, extending into the eastern parts of the Western Cape province (Engelbrecht et al. 2013). There are several apparently isolated records that require verification, and which are not currently considered part of the species' distribution,

Acontias orientalis, Makhanda, Eastern Cape province (© L. Kemp).

Family **Scincidae**

Acontias orientalis, Makhanda, Eastern Cape province (© T. Ping).

Acontias orientalis, 'tasmani morph', Gqeberha, Eastern Cape province (© L. Kemp).

namely at Xukulu in the Eastern Cape province, the southern Northern Cape province and the coastal regions around Oyster Bay, Gqeberha, Port Alfred and East London. *EOO*: 142 000 km^2; *Distribution*: 126 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in coastal alluvial soils and inland valleys in mesic to relatively dry situations (Branch 1998). *Habitat*: Savanna, Shrubland, Coastal sand dunes.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with much of the distribution in areas that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The taxonomic validity of the members of the *Acontias meleagris* species complex should be objectively re-evaluated.

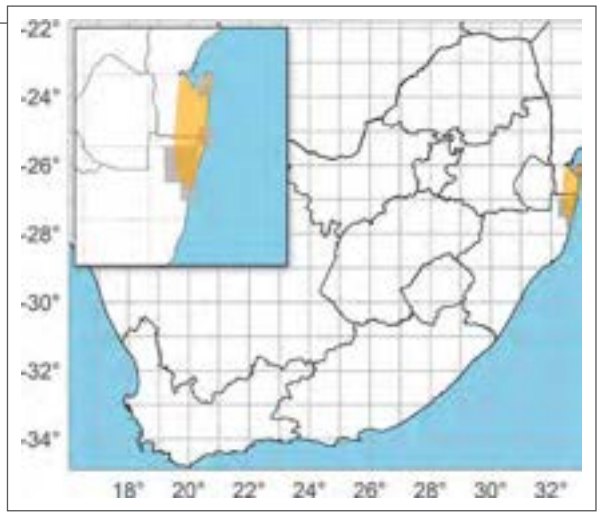
Acontias parietalis (Broadley, 1990)

Maputaland Blind Legless Skink

South African near-endemic

LC – Least Concern (Global)

Assessors: Pietersen, D.W., Verburgt, L., Farooq, H., Chapeta, Y.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Despite a relatively small distribution, this species is common in suitable habitat. Although some areas of appropriate habitat may be threatened by coastal development or recreational land use, much of the range is included in protected areas and other threats are minimal.

Taxonomic notes: Pietersen et al. (2018) elevated *A. parietalis* to specific status. Although KwaZulu-Natal populations of this species have been referred to *A. a. aurantiacus* (e.g., Branch 1998), Broadley (1990a) clarified that these, along with specimens from Inhaca Island, Mozambique, were referable to *A. parietalis*, with the former taxon restricted to southern coastal Mozambique. *Other important names*: *Typhlosaurus aurantiacus parietalis*.

Distribution: Occurs in coastal southern Mozambique and northeastern KwaZulu-Natal province, South Africa (Broadley 1990a; Pietersen et al. 2018). *EOO*: 7 500 km²; *Distribution*: 6 600 km².

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Fossorial, occurring in deep sandy soils in coastal sandveld and Grassland areas. *Habitat*: Forest, Grassland, Savanna.

Threats: No significant threats.

Population trend: The population size is suspected to be stable because this is a widespread and common species that occurs mainly in areas that are not notably impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Acontias parietalis, Kosi Bay, KwaZulu-Natal province (© J. Marais).

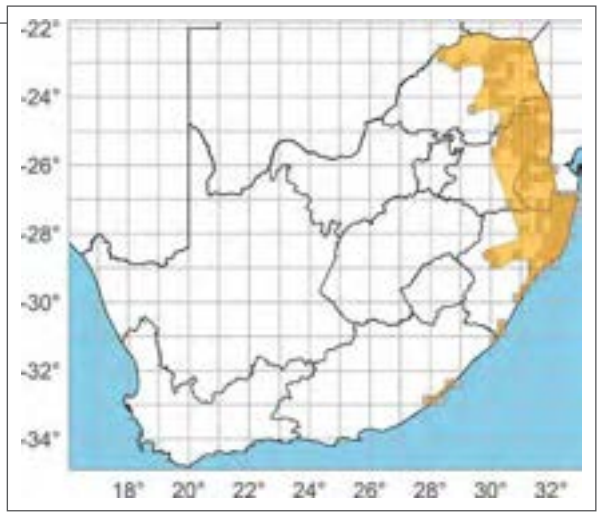
Family **Scincidae**

Acontias plumbeus Bianconi, 1849

Giant Legless Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: This species has a large range and occurs in a variety of habitat types. It is not affected by any major threats and is not undergoing significant population declines at present.

Taxonomic notes: The taxonomic status of isolated populations on the eastern escarpment of Zimbabwe requires investigation. *Acontias poecilus* has been synonymised with *A. plumbeus* (Zhao et al. 2019). *Other important names*: *Acontias poecilus*.

Distribution: Occurs in the eastern extent of southern Africa, from coastal Eastern Cape province northwards to southern Mozambique and inland to northern and western Limpopo province and eastern Mpumalanga province, South Africa, with an isolated population in the Eastern Highlands of Zimbabwe (Broadley 1990b; Zhao et al. 2019). *EOO*: 412 000 km^2; *Distribution*: 157 000 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: This fossorial skink occurs in various habitat types from dry Shrubland and Savanna, to Woodland humus and Forest floors. *Habitat*: Forest, Grassland, Savanna.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in some areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Acontias plumbeus, Gxarha, Eastern Cape province (© L. Kemp).

Acontias plumbeus, Port Edward, KwaZulu-Natal province (© J. Marais).

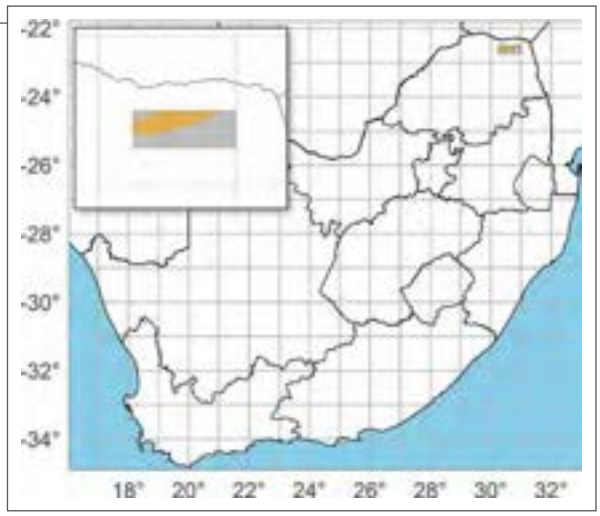
Acontias richardi (Jacobsen, 1987)

Richard's Legless Skink

South African endemic

NT – Near Threatened B1b(iii) (Global)

Assessors: Conradie, W., Pietersen, D.W., Alexander, G.J., Weeber, J., Tolley, K.A., Bauer, A.M.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).
2017: Near Threatened (IUCN assessment).
2014: Near Threatened (SARCA).

Assessment rationale: This is a rarely encountered skink, recorded from only a few sites. Within the inferred distribution, approximately 12% of the habitat has been transformed by agriculture and urbanisation. The habitat loss is ongoing, with 3% of the total being lost since 2013. Assessed as Data Deficient in 2018, new records of this skink have allowed for the distribution to be inferred and an assessment to be carried out. It is considered Near Threatened because it is likely that the small range would overlap with proposed large-scale coal mining development. If the mining becomes active, the species would most likely be at fewer than five locations.

Taxonomic notes: No taxonomic issues. *Other important names*: *Typhlosaurus lineatus richardi*.

Distribution: Known from just a few localities in the northern parts of Limpopo province, South Africa (Jacobsen 1989; Lamb et al. 2010; https://vmus.adu.org.za). *EOO*: 680 km²; *Distribution*: 660 km².

Country of occurrence: South Africa.

Habitat and ecology: Occurs in deep aeolian sand deposits north of the Soutpansberg at about 430–800 m a.s.l. and is sometimes found under rotting logs (Jacobsen 1987a, 1989). *Habitat*: Savanna.

Threats: The area where this species occurs is potentially under threat from proposed coal mining and the mining footprint could be large enough to impact part of the distribution. It is therefore suspected to be at fewer than five threat-defined locations, although it is unknown when the threat of mining is likely to become active (see: www.mcmining.co.za). There is some historical habitat loss due to agriculture and urbanisation, but the impact is suspected to be relatively minor.

Population trend: There are few records of this species, so the population trend is unknown.

Conservation and research recommendations: Better information on geographic range and habitat preference is needed. The overall landscape has had some habitat transformation, but this species has a small range, so it would be useful to assess the impact of the current habitat transformation. The potential impact from the proposed large-scale coal mining should be monitored.

Acontias richardi, Tshikhudini, Limpopo province (© R.I. Stander).

Family **Scincidae**

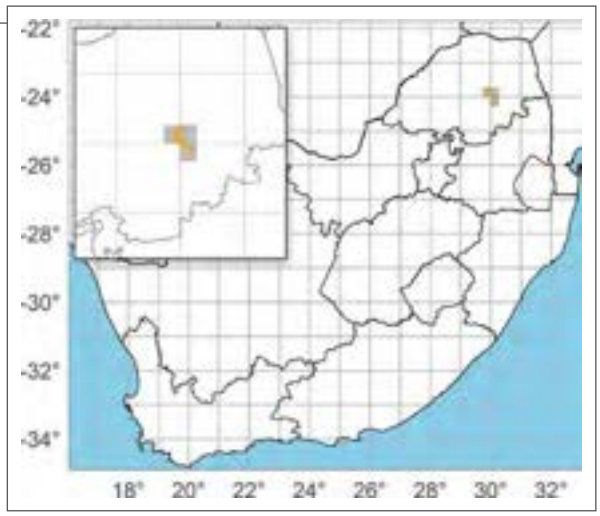
Acontias rieppeli Lamb, Biswas & Bauer, 2010

Woodbush Legless Skink

South African endemic

EN – Endangered B1ab(i,ii,iii,iv) (Global)

Assessors: Pietersen, D.W., Conradie, W., Bauer, A.M., Bates, M.F., Tolley, K.A., Alexander, G.J., Weeber, J.



Previous Red List categories:

2018: Near Threatened (Global IUCN assessment).
2017: Endangered (IUCN assessment).
2014: Endangered (SARCA).
1996: Vulnerable (IUCN assessment) as *Acontophiops lineatus*.
1994: Rare (IUCN assessment) as *Acontophiops lineatus*.

Reason for recent change: Non-genuine.

Assessment rationale: The species has a small range with a significant historical decline in extent and quality of habitat. Half of the distribution is highly transformed by silviculture and this has significantly reduced the area of natural habitat available for this species causing a decline in EOO and AOO. The lack of recent records from the north of the range suggests the EOO and AOO decline is ongoing. At least 50% of the population is in small habitat patches that may not have connectivity and gene flow, and therefore may not be viable into the future. Thus, it is considered severely fragmented and inferred to be in decline due to this substantial habitat transformation. Although it has been recorded from the edges of pine plantations (M.F. Bates, unpubl. data 2014), there is no evidence

Acontias rieppeli, Iron Crown, Limpopo province (© L. Kemp).

that these represent viable subpopulations. However, there is some uncertainty regarding whether the extent and quality of habitat and EOO are still declining at rates significant enough to warrant the listing of this species as Endangered, and there is uncertainty on the degree of population fragmentation. If the habitat loss does not continue and there is sufficient connectivity between subpopulations in the north of the range, a category of Near Threatened might be more appropriate. For the present assessment, a precautionary approach has been applied and the species is considered Endangered. Assessed as Near Threatened in 2018 given that a few observations of individuals near the edges of pine plantations suggested it might be tolerant of transformed habitats. Recent re-evaluation of this information suggests this is probably not the case and that these individuals do not provide sufficient connectivity between isolated subpopulations.

Taxonomic notes: No taxonomic issues. *Other important names*: *Acontophiops lineatus*.

Distribution: Occurs along the mountainous escarpment of southern Limpopo province, South Africa, in the Grasslands of the Wolkberg. *EOO*: 870 km^2; *Distribution*: 600 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A fossorial species that occurs in mesic conditions in montane habitats at elevations of 1 600–2 000 m a.s.l. (Jacobsen 1989). It has been found sheltering under rocks embedded on grassy slopes and ridges, but also up to 20–50 cm below the surface in reddish-brown soil. There have been a few observations on the edges of plantations (Bauer & Bates 2014), but these scatted observations are not considered to be representative of viable subpopulations. *Habitat*: Grassland.

Threats: At least half the range is heavily impacted by urbanisation and afforestation, and this is suspected to have a negative impact on gene flow and connectivity between subpopulations.

Population trend: This species is locally common in areas of suitable habitat (Jacobsen 1989) but is rarely recorded from transformed areas. The population is considered severely fragmented given that more than half the population occurs in small, isolated subpopulations that are unlikely to be viable in the long term. Although a few individuals have been recorded from the edges of plantations (Conradie et al. 2018), there is no evidence that these individuals contribute to gene flow and migration between isolated subpopulations. It is suspected that the population is in decline and that small, isolated subpopulations are being lost.

Conservation and research recommendations: Information on the level of tolerance this species has for transformed landscapes is needed, and as such, targeted surveys in both transformed and intact habitat would be informative. The degree of subpopulation fragmentation and lack of connectivity in the northern part of the range should be quantified through a population genetic approach.

Family **Scincidae**

Acontias tristis Werner, 1910

Namaqua Dwarf Legless Skink

South African endemic

LC – Least Concern (Global)

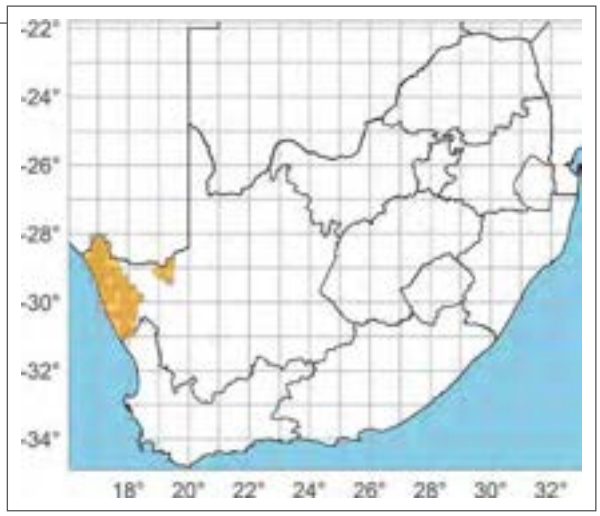
Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, with no major threats.

Taxonomic notes: Phylogenetic analyses show shallow divergence between *A. tristis*, *A. grayi*, *A. lineatus* and *A. litoralis* (Daniels et al. 2006; Lamb et al. 2010) as well as paraphyly between these taxa (Janse van Vuuren 2009). Furthermore, there are no clear, diagnostic morphological differences among taxa (but see Broadley & Greer 1969), and there are some limited areas of sympatry. This has cast some doubt as to the current taxonomic arrangement. *Other important names*: *Microacontias tristis*.

Acontias tristis, Richtersveld National Park, Northern Cape province (© N. Evans).



Distribution: Occurs in the northwestern parts of the Northern Cape province, South Africa, extending marginally into the Western Cape province. Records in South Africa that are near the Namibian border suggest that it may also occur in that country. Previously noted as being in two subpopulations due to gap in records in the Northern Cape province (Bauer & Conradie 2018a), it is possible that the distribution is continuous. *EOO*: 60 000 km^2; *Distribution*: 32 300 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in sandy soils in mesic microhabitats, in arid to semi-arid habitats (Bauer & Branch 2003[2001]). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: The current information on the distribution suggests that there might be two isolated subpopulations of *A. tristis*. This could, however, be due to poor sampling in the intervening area and better survey data would therefore provide information on the status of the subpopulations. An investigation into the taxonomic status of the taxa in the *A. lineatus* species complex is required.

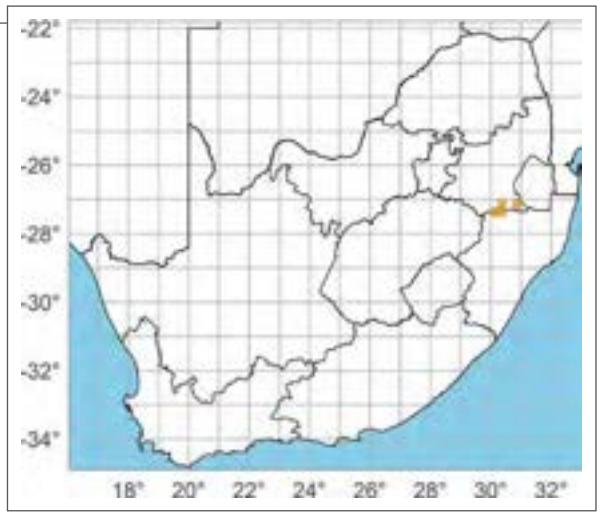
Acontias wakkerstroomensis Conradie, Busschau & Edwards, 2018

Wakkerstroom Legless Skink

South African endemic

DD – Data Deficient (Global)

Assessor: Conradie, W.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).

Assessment rationale: This species has been recorded from only four localities where habitat transformation affects at least 50% of the landscape. However, the species could be distributed more widely in areas that are not heavily impacted. The EOO could range from less than 5 000 km² to tens of thousands of square kilometres. Thus, there is a large degree of uncertainty regarding the application of criteria, and it is possible the status could range from Least Concern if the range is large, to Endangered or Critically Endangered if the range is small but is centred in areas where there is notable habitat loss.

Taxonomic notes: Recently split from *Acontias breviceps* Essex, 1925, although it is closely related to *Acontias gracilicauda* Essex, 1925 (Conradie et al. 2018). *Other important names*: *Acontias breviceps*.

Distribution: There are a few scattered records from southeastern Mpumalanga and adjacent KwaZulu-Natal provinces, South Africa. Its overall distribution and EOO cannot be estimated with any confidence and therefore have not been included.

Country of occurrence: South Africa.

Habitat and ecology: This species has been found under rocks in Grasslands and along road verges. *Habitat*: Grassland.

Threats: Threats to this species are unknown. It has been recorded from an area that has significant habitat transformation, but it is possible that it occurs in areas that are not heavily transformed.

Population trend: Lack of information on the distribution and threats preclude an assessment of the population status or trends. Previous surveys have noted this skink is not abundant where it has been recorded (Conradie et al. 2018).

Conservation and research recommendations: Further work is needed to document where this species occurs and whether threats within its range are significant.

Acontias wakkerstroomensis, Wakkerstroom, Mpumalanga province (© W. Conradie).

Family **Scincidae**

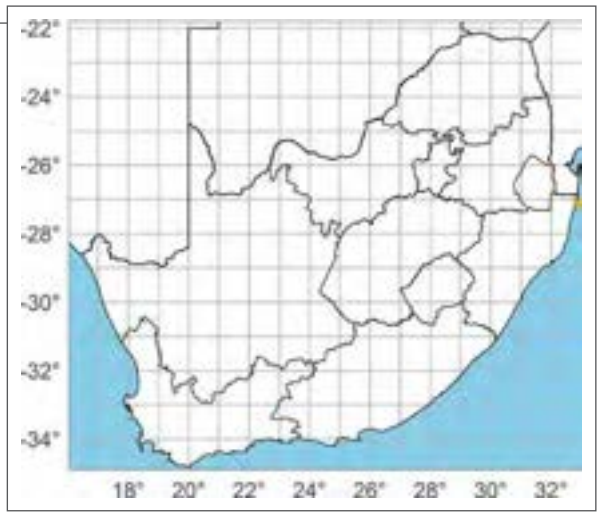
Cryptoblepharus africanus (Sternfeld, 1918)

African Coral Rag Skink

South African peripheral

CR – Critically Endangered D (Regional)

Assessors: Tolley, K.A., Alexander, G.J., Conradie, W., Weeber, J., Masterson, G., Pietersen, D.W.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Endangered (SARCA).

Assessment rationale: Has a large distribution throughout East Africa and is considered Least Concern globally. However, in South Africa, this skink occurs in one locality as a small subpopulation, with the nearest conspecifics occurring at least 500 km to the north in Mozambique. The South African subpopulation falls within a geographically defined area and is isolated from populations outside the region. Therefore, the criteria for assessing this species regionally can be used without modification, applied as if this subpopulation is an endemic taxon.

Long-term demographic monitoring suggests that the adult population size fluctuates to fewer than 50 individuals, and this subpopulation is therefore subject to demographic stochasticity and elevated extinction risk by virtue of the extremely low number of individuals, which has resulted in a category change to Critically Endangered. Although this isolated subpopulation cannot be considered severely fragmented, it is at a single threat-defined location.

Taxonomic notes: The taxonomy of the genus *Cryptoblepharus* is controversial despite several studies that attempted to resolve the outstanding issues (Rocha et al. 2006; Horner 2007). Based on mitochondrial sequence analysis, subspecific assignments

Cryptoblepharus africanus, Black Rock, KwaZulu-Natal province (© T. Ping).

of the Western Indian Ocean *Cryptoblepharus* taxa, including *C. boutonii africanus*, were considered valid (Rocha et al. 2006). In contrast, morphological characteristics were assessed to elevate *C. boutonii africanus* to species status and it was considered distinct from *C. ahli* (Horner 2007). The taxonomy of Horner (2007) is followed in this assessment. *Other important names*: *Cryptoblepharus boutonii*.

Distribution: This skink has a widespread but patchy distribution along the coast and coastal islands of eastern Africa from Somalia to Mozambique (Spawls et al. 2018). There are records in northern Mozambique and an apparently isolated subpopulation at Tofu, southern Mozambique (see https://www.inaturalist.org), forming an apparent distribution gap of more than 1 000 km. There is an isolated subpopulation in South Africa at Black Rock, a small outcrop of fossilised dune deposits in northern KwaZulu-Natal province. The Black Rock subpopulation is more than 500 km south of other records at Tofu, Mozambique and probably established through rafting of individuals from elsewhere in the main population (Haacke 2002). Records from inland (in Somalia and Zimbabwe) are almost certainly in error (Lanza 1990; Horner 2007). *EOO/AOO*: 4 km^2; *Distribution*: 0.01 km^2.

Countries of occurrence: Kenya, Mozambique, Somalia, Tanzania, South Africa.

Habitat and ecology: A habitat specialist, occurring only along the littoral zone of the eastern African coast, on cliffs and outcrops of roughened coral rag or fossilised dune deposits (Haacke 2002, Spawls et al. 2018). Individuals take refuge in the nooks on the rough surface (Haacke 2002) and will readily jump into the water to swim to safety (Spawls et al. 2018). They prey on insects, marine crustaceans and fishes, foraging in the intertidal zone (Haacke 2002; Spawls et al. 2018). *Habitat*: Marine coastal.

Threats: The Black Rock subpopulation is fully protected as it occurs entirely within iSimangaliso Wetland Park, a UNESCO World Heritage Site. However, the small population size does make this subpopulation vulnerable to stochastic events such as intense storms that might destroy the habitat through erosion by wave action. Given it is at only one location and there are few mature adults in the population, a single threat event could wipe out most or all individuals.

Population trend: This skink is common across most of its distribution and can occur at high abundance in appropriate habitat (Spawls et al. 2018). The South African subpopulation, however, is very small in number of individuals. Long-term monitoring of abundance (1978–2001) suggests that the number of individuals has fluctuated from fewer than 50 to just over 100 individuals (Haacke 2002). Given that the number of individuals has fluctuated to fewer than 50 individuals (both adults and juveniles), it is possible that the number of adults in the subpopulation can be significantly lower than 50. Therefore, precautionary principles apply as stipulated in the IUCN Guidelines (IUCN Standards and Petitions Committee 2019) and the lowest estimate of (adult) individuals of fewer than 50 is applied, resulting in an assessment of Critically Endangered. The population has not been censused since 2001, although there are recent records (2018, 2020) on iNaturalist (https://www.inaturalist.org) and ReptileMap (https://vmus.adu.org.za) that indicate that the subpopulation is still present. While the species is not considered in decline, this small subpopulation is extremely vulnerable to stochastic effects, and this increases the extinction risk.

Conservation and research recommendations: Given the small size of the subpopulation at Black Rock, population demographic monitoring should be carried out to ensure that the subpopulation remains stable. Although the Black Rock subpopulation probably was established through rafting from elsewhere in the distribution range (Haacke 2002), other potential suitable cliffs and outcrops in the distribution gap between Tofu and Black Rock should be surveyed for other isolated subpopulations. The small subpopulation could potentially be impacted should there be heavy utilisation of Black Rock by visitors. An assessment of this potential impact is needed, with access control for the site considered as an option to minimise impact, if necessary.

Family **Scincidae**

Mochlus sundevallii (Smith, 1849)

Sundevall's Writhing Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

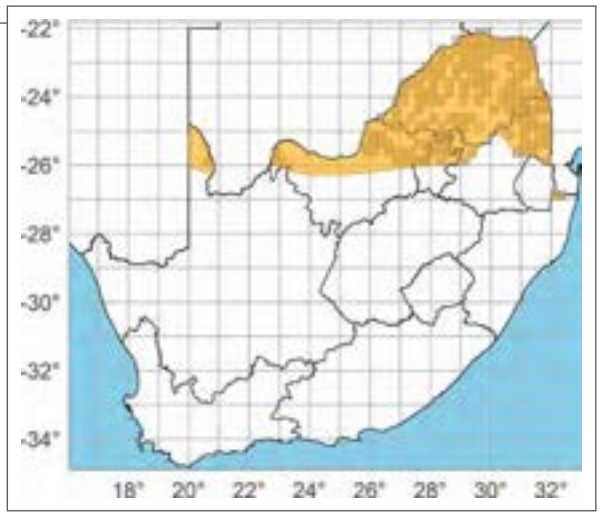
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2010: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Mochlus sundevallii sundevallii* – Least Concern (SARCA).

Assessment rationale: Widespread and abundant with no known substantial threats.

Taxonomic notes: Freitas et al. (2018) synonymised the extralimital *M. afer* with *M. sundevallii*, showing that the former was merely a colour morph of the latter. No other outstanding taxonomic issues. *Other important names*: *Mochlus afer*; *Lygosoma sundevalli*.

Distribution: Very widespread, occurring across southern and East Africa (Broadley 1966b; Freitas et al. 2018; Spawls et al. 2018). Regionally, it occurs in northeast South Africa, into Eswatini and extending across the northern reaches of North West province into the northern Kalahari. *EOO*: 461 000 km²; *Distribution*: 224 0000 km².



Mochlus sundevallii, Magaliesberg, Gauteng province (© L. Kemp).

Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Somalia, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: A fossorial species that occurs in arid and mesic habitats. Found in a variety of substrates from sand to heavy clay soils, but most common in sandy substrates. Individuals shelter under surface cover such as logs, rocks or leaf litter (FitzSimons 1943; Jacobsen 1989; Branch 1998). *Habitat*: Forest, Grassland, Savanna.

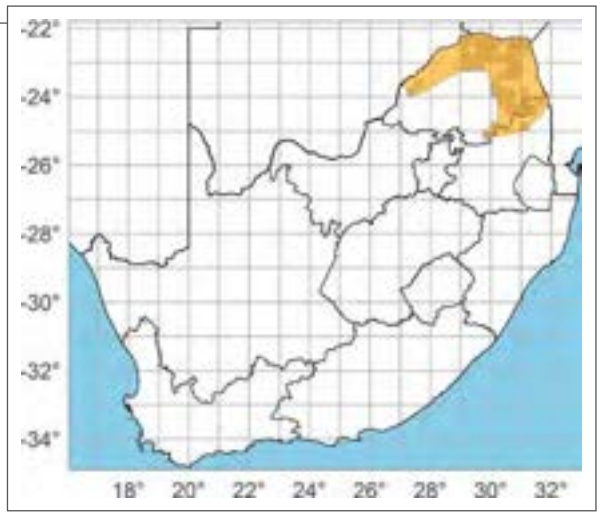
Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Panaspis maculicollis Jacobsen & Broadley, 2000

Spotted-neck Snake-eyed Skink



LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern as *Afroablepharus maculicollis* (SARCA).

Assessment rationale: Widespread with no significant threats.

Taxonomic notes: Phylogenetic analyses suggest that there are several cryptic taxa within the *P. maculicollis* group (Medina et al. 2016), some of which have been described in recent years (Ceríaco et al. 2018). *Other important names*: *Afroablepharus maculicollis*.

Distribution: Widespread across southern Africa, entering southern Angola (Branch 1998; Jacobsen & Broadley 2000; Conradie et al. 2016). In South Africa, it occurs in the northeast, from northern Limpopo province extending marginally into Mpumalanga province. *EOO*: 113 000 km^2; *Distribution*: 73 800 km^2.

Countries of occurrence: Angola, Botswana, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Occurs across several habitat types from rocky outcrops to open Grasslands from 200 to 900 m a.s.l. elevation, usually in areas where there is an accumulation of leaf litter (Jacobsen & Broadley 2000). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species and most of the distribution is not impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the candidate species retrieved by Medina et al. (2016) should be evaluated.

Panaspis maculicollis, female colouration, Klaserie, Limpopo province (© D.W. Pietersen).

Panaspis maculicollis, male colouration, Pafuri, Limpopo province (© C. Keates).

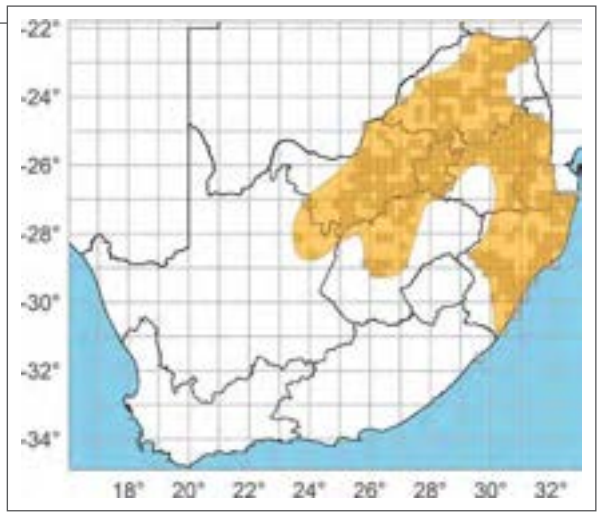
Family **Scincidae**

Panaspis wahlbergii (Smith, 1849)

Wahlberg's Snake-eyed Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern *Afroablepharus wahlbergii* (SARCA).

Assessment rationale: Widespread and abundant with no major threats.

Taxonomic notes: *Panaspis wahlbergii* appears to be a complex of at least nine cryptic species (Medina et al. 2016), some of which have been described, elevated or reinstated in recent years (Kilunda et al. 2019; Colston et al. 2020). In this assessment, *P. wahlbergii* includes all the undescribed cryptic lineages. *Other important names*: *Afroablepharus wahlbergii*.

Distribution: Widespread across southern and East Africa, as well as parts of central Africa. In the region it occurs from the northeast, extending southwards into central South Africa, central KwaZulu-Natal province, and across Eswatini. There is an isolated record at the southern extent of the range (Nicolau et al. 2018), which might suggest the distribution is patchy in that area. It might occur in southeastern Botswana, although it has not yet been recorded there. *EOO*: 614 000 km^2; *Distribution*: 397 900 km^2.

Countries of occurrence: Angola, Democratic Republic of the Congo, Eswatini, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a wide variety of habitats, ranging from rocky outcrops to open Highveld Grasslands usually in areas where there is an accumulation of leaf litter (Branch 1998; Jacobsen & Broadley 2000; Masterson et al. 2008). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with parts of the distribution not impacted by habitat transformation.

Conservation and research recommendations: The taxonomy of the undescribed lineages requires further study.

Panaspis wahlbergii, male colouration, Doornkop, Carolina, Mpumalanga province (© W. Conradie).

Panaspis wahlbergii, female colouration, Bronkhorstspruit, Gauteng province (© L. Kemp).

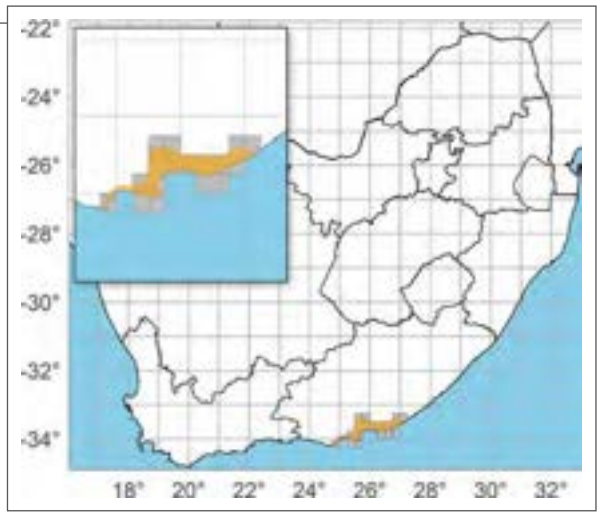
Scelotes anguinus (Boulenger, 1887)

Algoa Dwarf Burrowing Skink

South African endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a moderate-sized range and is considered abundant. Although there has been some habitat modification within its range, most of the habitat is intact and the range includes several protected areas.

Taxonomic notes: The spelling of *Scelotes anguinus* was previously in error as *Scelotes anguineus* (see Raw 2022). *Other important names*: none.

Distribution: Occurs in the southeastern margin of South Africa, largely restricted to the Algoa Bay region, Eastern Cape province. *EOO*: 9 460 km^2; *Distribution*: 4 970 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Inhabits coastal dunes and Thickets within the Fynbos biome (Branch & Braack 1987). *Habitat*: Coastal sand dunes.

Threats: There are no significant threats to this species.

Population trend: This species occurs in high abundance, and the extent of habitat transformation is small in relation to the range size. There are no suspected population declines.

Conservation and research recommendations: None recommended at present.

Scelotes anguinus, Cape St Francis, Eastern Cape province (© D.W. Pietersen).

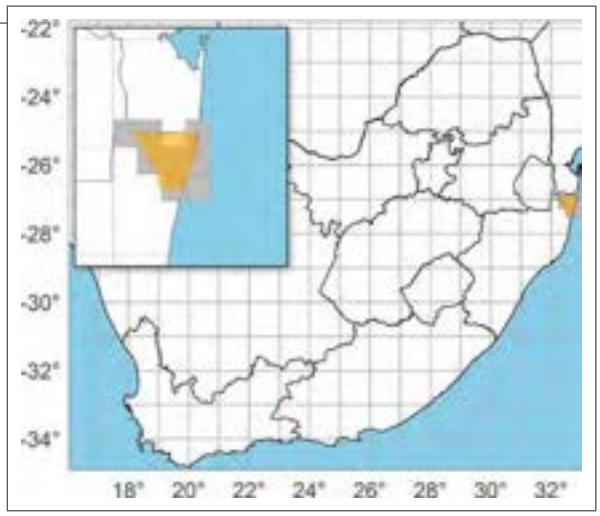
Family **Scincidae**

Scelotes arenicola (Peters, 1854)

Zululand Dwarf Burrowing Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W., Marais, J.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a restricted range in South Africa but can be locally abundant and likely receives immigration from Mozambique. It also occurs in several large, protected areas and the habitat in at least half its range is reasonably intact. Although this species could potentially qualify as Near Threatened, the South African part of the population is not isolated from Mozambique and therefore the status of Least Concern is appropriate.

Taxonomic notes: No taxonomic issues. The correct spelling of the specific epithet is '*arenicola*' despite *Scelotes* being masculine (Bauer 2016). *Other important names*: *Scelotes arenicolus*.

Distribution: Has a narrow distribution, extending along the coastal plain from Lake Sibaya in KwaZulu-Natal province, South Africa into Mozambique as far north as Massinga (Broadley 1994; Pietersen 2014). *EOO*: 2 880 km^2; *Distribution*: 2 590 km^2.

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Inhabits vegetated coastal dunes, sandy coastal areas and lowland areas extending about 60 km inland (Bourquin 2004). It is unknown whether this skink can tolerate significantly altered habitats. *Habitat*: Grassland, Shrubland, Savanna.

Threats: Although this skink occurs in several, large, protected areas, approximately 40–50% of the range occurs in an area that is heavily transformed by agriculture and rural settlements. Despite this, most of the range is intact so this habitat alteration is unlikely to be a significant threat to the regional population.

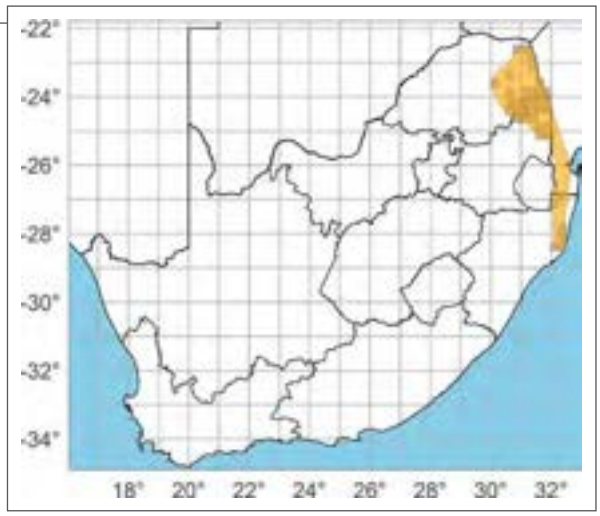
Population trend: Although much of the range is in heavily transformed areas, the larger part of the range is in areas that cannot be considered to have lost connectivity between subpopulations. The population is therefore not considered to be severely fragmented and population declines, if ongoing, are suspected to be minor.

Conservation and research recommendations: No recommendations.

Scelotes arenicola, Kosi Bay, KwaZulu-Natal province (© D.W. Pietersen).

Scelotes bidigittatus FitzSimons, 1930

Lowveld Dwarf Burrowing Skink



Regional near-endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Fairly widespread and common, with no significant threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs in the northeastern parts of the region, where it presumably extends southwards into two areas of South Africa, namely Limpopo and northeastern KwaZulu-Natal provinces (Pienaar et al. 1983; Broadley 1994). It has also been recorded from southern Mozambique (Jordaan 2021). Therefore, this lizard is considered a regional near-endemic. *EOO*: 84 500 km^2; *Distribution*: 52 350 km^2.

Countries of occurrence: South Africa, Mozambique.

Habitat and ecology: Fossorial, occurring under debris in loose soil from sea level to 1 100 m a.s.l. (Pienaar et al. 1983; Jacobsen 1989; Bourquin 2004). *Habitat*: Forest, Savanna, Grassland.

Threats: The western extent of the distribution is heavily impacted by habitat transformation from expansion of human settlements and associated small-scale agriculture, and from expansion of urban areas.

Population trend: Although there has been a reduction in habitat quality in some parts of its range, the species is locally abundant and a large portion of the range is in protected areas. The population is thus unlikely to have declined significantly.

Conservation and research recommendations: Confirmation of this species' occurrence in Mozambique is needed.

Scelotes bidigittatus, Punda Maria, Kruger National Park, Limpopo province (© C. & S. Dorse).

Family **Scincidae**

Scelotes bipes (Linnaeus, 1766)

Silvery Dwarf Burrowing Skink

South African endemic

LC – Least Concern (Global)

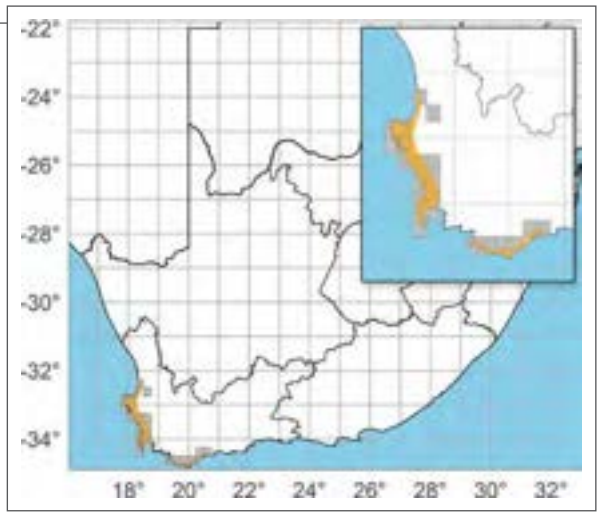
Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a relatively large EOO and despite habitat alteration in some parts of its range, it is usually locally abundant over most of the range. It is therefore not considered to be at risk of extinction.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Scelotes bipes, Bokbaai, Western Cape province (© L. Kemp).



Distribution: Occurs in the southwestern coastal margin of South Africa, from the Agulhas region westward through the Cape Town area and extending northwards along the west coast. It has been recorded from Robben Island in Table Bay. The presumed distribution gaps (Bauer 2014d) are probably a result of undersampling, although the gap between the western and southern populations may be real. An apparently isolated record from on top of the Piketberg requires confirmation, as the habitat there is marginal. *EOO*: 36 700 km^2; *Distribution*: 6 270 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, occurring in areas of sandy soil (Branch 1998). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: In spite of the small geographic range of this species, parts of the distribution are in areas where there has been only moderate habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Family **Scincidae**

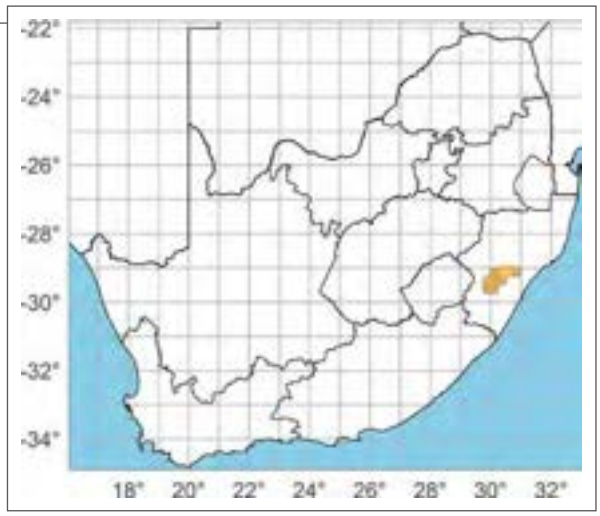
Scelotes bourquini Broadley, 1994

Bourquin's Dwarf Burrowing Skink

South African endemic

VU – Vulnerable B1ab(i,iii,v) (Global)

Assessors: Bauer, A.M., Conradie, W., Marais, J.



Previous Red List categories:

2018: Vulnerable (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).
1996: Vulnerable (Global IUCN assessment) as *Scelotes guentheri*.
1994: Rare (Global IUCN assessment) as *Scelotes guentheri*.

Assessment rationale: The species has a small EOO and is defined as severely fragmented because more than half the population is in small and isolated subpopulations that are unlikely to have significant connectivity or to be viable into the future. There is a continuing decline in extent and quality of habitat due to urban development and agriculture. Most of the range is within heavily transformed habitat, and the fossorial nature of this species makes it unlikely that it can move through transformed landscapes such as fields and urban areas.

Taxonomic notes: Raw (1973) assigned specimens from the KwaZulu-Natal Midlands to *S. guentheri*, but these specimens were later described as *S. bourquini* (Broadley 1994). A photograph of an individual from Qudeni (KwaZulu-Natal province) has been assigned to *S. bourquini* (Broadley 1994). Raw (2020) described this population as a separate species (*S. farquharsoni*), but this requires confirmation. Although Raw (2021) suggests that *S. bourquini* should be synonymised with *S. guentheri*, this conclusion was based on limited evidence and requires further data to confirm the result. *Other important names*: *Scelotes guentheri*.

Scelotes bourquini, Midlands, KwaZulu-Natal province (© D. van Eyssen).

Family **Scincidae**

Distribution: Occurs in the Midlands of KwaZulu-Natal province, South Africa. *EOO*: 5 470 km^2; *Distribution*: 5 100 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This fossorial species inhabits mesic areas in primary and secondary Grasslands at elevations of 950–1 250 m a.s.l. (Bourquin 2004). *Habitat*: Grassland.

Population trend: The species is thought to be in decline as the subpopulations are severely fragmented. There is significant habitat transformation in the geographic range and, due to its fossorial habits, it is assumed that connectivity between fragments has been lost or severely reduced. The geographic extent and demographic sizes of these subpopulations are unknown.

Threats: Habitat is threatened by urban development, agriculture and silviculture. Given the presumed limited dispersal ability, metapopulation processes are likely to be disrupted by the heavy habitat fragmentation.

Conservation and research recommendations: *Scelotes bourquini* occurs in only three protected areas larger than 10 km^2, with most of its distribution within highly transformed habitat fragments. Surveys to better assess whether it can persist in transformed areas would allow for a better-informed assessment.

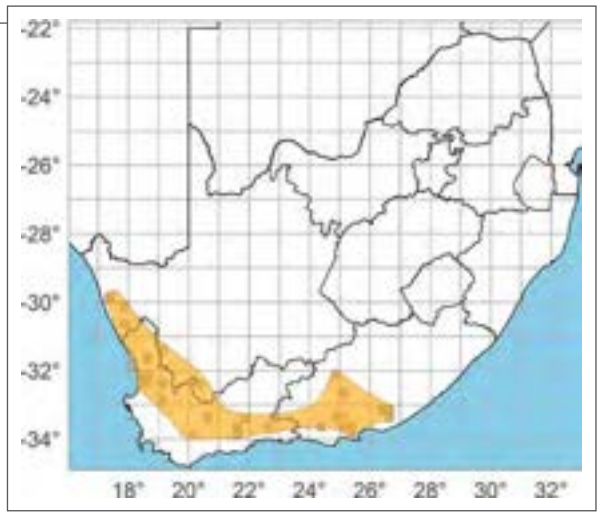
Scelotes caffer (Peters, 1861)

Cape Dwarf Burrowing Skink

South African endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and locally abundant, occurring in areas that are not significantly impacted by habitat transformation.

Taxonomic notes: Morphological variation within this species suggests that there could be cryptic species (Marais & Bauer 2014a). *Other important names*: none.

Distribution: Occurs across southwestern South Africa from the Eastern Cape province westwards, and north along the coastal margin of the west coast of South Africa. Although previously thought to occur in disjunct subpopulations (Branch 1990a; Branch & Bauer 1995), improved sampling suggests that the range is continuous (Rebelo et al. 2018). *EOO*: 234 000 km^2; *Distribution*: 118 000 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Shelters under stones or under dead vegetation (Branch & Bauer 1995; Branch 1998). *Habitat*: Shrubland.

Population trend: The population size is assumed to be stable because this is a widespread and abundant

Scelotes caffer, near Calitzdorp, Western Cape province (© T. Ping).

Family **Scincidae**

Scelotes caffer, Glen Harry Game Reserve, Eastern Cape province (© W. Conradie).

Scelotes caffer, Nieuwoudtville, Northern Cape province (© C. & S. Dorse).

species with portions of the range that are not significantly impacted by habitat transformation.

Threats: There are no significant threats to this species.

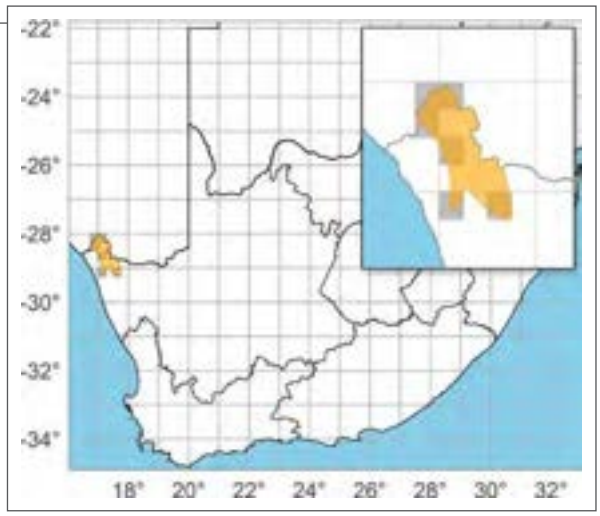
Conservation and research recommendations: Because of the fossorial nature of this species, the perceived gaps between the supposed subpopulations (Branch 1990a; Branch & Bauer 1995) were artefacts of poor sampling. However, based on the perception that there is morphological variation across the range, there could be cryptic taxa. To examine this question, additional survey data are required, coupled with a phylogenetic analysis.

Scelotes capensis (Smith, 1849)

Western Dwarf Burrowing Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W., Marais, J.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although the range is small within South Africa, it is relatively widespread in Namibia, and may be locally abundant with no substantial threats. It is unknown whether the South African part of the range is sustained by immigration from Namibia. The Orange River, which forms the political border between these countries, might reduce immigration, particularly given the fossorial nature of this skink.

Taxonomic notes: No taxonomical issues. *Other important names*: none.

Distribution: Occurs along the western margin of Namibia and into northern South Africa in the Richtersveld, extending as far south as the Namaqua region (Branch 1994; Bauer & Branch 2003[2001]; Griffin 2003). *EOO*: 7 860 km²; *Distribution*: 5 810 km².

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Inhabits mesic microhabitats on vegetated rocky slopes in succulent veld, and rocky areas in the southern Namib Desert (Berger-Dell'mour 1987; Branch 1994; Bauer & Branch 2003[2001]). Usually occurs on slopes at elevations of up to at least 1 000 m a.s.l. *Habitat*: Desert, Shrubland.

Population trend: Because this lizard occurs mainly in an arid region that has not been significantly impacted by habitat transformation, the population is not thought to have declined.

Threats: There are no currently plausible threats to this species. It does, however, occur in an area that is predicted to be heavily influenced by climate change (Engelbrecht et al. 2015), and this could be a threat in the future.

Conservation and research recommendations: It would be useful to assess whether this species might be influenced by climate change. This could potentially be monitored by long-term targeted surveys for shifting occurrence, and/or through an investigation of tolerance to rising temperatures and changes in rainfall.

Scelotes capensis, Richtersveld National Park, Northern Cape province (© K. Kyle).

Family **Scincidae**

Scelotes fitzsimonsi Broadley, 1994

FitzSimons' Dwarf Burrowing Skink

South African endemic

LC – Least Concern (Global)

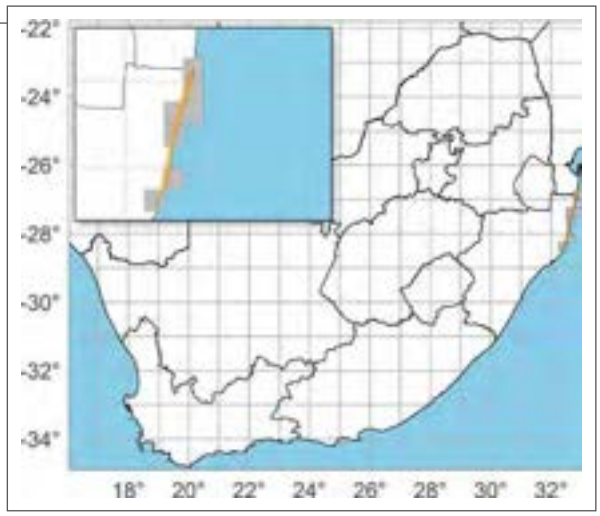
Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species has a small range but is fairly abundant. Approximately 80% of its distribution falls within a large, protected area (iSimangaliso Wetland Park, a UNESCO World Heritage Site), so the species is not considered to be at risk of extinction at present. However, there is an emerging threat of socioeconomically driven land invasion into the protected area by local communities and this should be monitored. If this threat becomes active and given the small EOO – most of which falls within the protected area – this species could rapidly become threatened.

Taxonomic notes: No notable issues. Records from Vernon Crookes Nature Reserve and Durban are probably incorrectly identified or represent undescribed species (Broadley 1994). *Other important names*: none.

Distribution: Occurs in northeastern KwaZulu-Natal province, South Africa, from the Mozambique border at Kosi Bay southwards to St Lucia village. It has not yet been recorded from southern Mozambique, but it is expected to occur there. *EOO*: 1 150 km^2; *Distribution*: 1 060 km^2.



Country of occurrence: South Africa.

Habitat and ecology: Occurs in sandy soil in and adjacent to coastal dune forest below 100 m a.s.l. elevation (Bourquin 2004). *Habitat*: Forest.

Threats: No significant threats as about 80% of its distribution falls within the iSimangaliso Wetland Park and World Heritage Site, a very large, protected area managed by the provincial conservation authority, Ezemvelo KZN Wildlife. With the majority of the range falling within this protected area, the population had been considered secure. Despite the official protection status, the park has become vulnerable to the threat of socioeconomically driven land invasion by local communities. Given that other protected areas in South Africa recently have been de-gazetted due to land invasions in favour of informal human settlement (e.g., Western Cape Government 2022), this is a plausible emerging threat.

Population trend: Because about 80% of the geographic range of this species is in a protected area, the population size is assumed to be stable at present.

Conservation and research recommendations: It would be useful to survey southern Mozambique to ascertain whether the species occurs there. In addition, there is an emerging threat of socioeconomically driven land invasion by local communities within protected area where this species primarily occurs. Changes in land use and potential rapid habitat destruction will require careful monitoring.

Scelotes fitzsimonsi, Cape Vidal, KwaZulu-Natal province (© C. & S. Dorse).

Family **Scincidae**

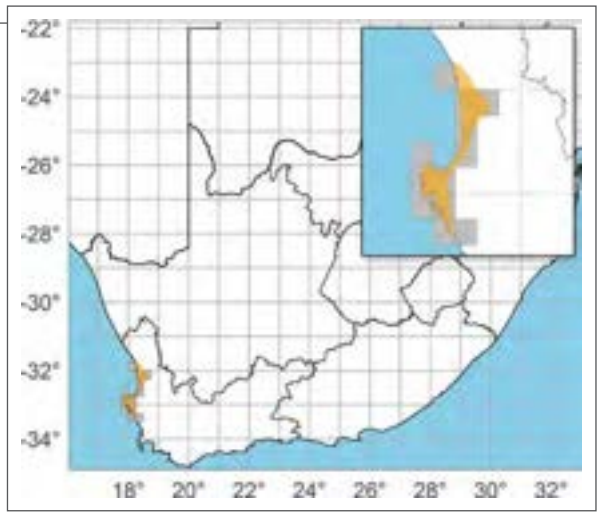
Scelotes gronovii (Daudin, 1802)

Gronovi's Dwarf Burrowing Skink

South African endemic

NT – Near Threatened B1b(i,ii,iii,iv,v) (Global)

Assessors: Conradie, W., Bauer, A.M., Alexander, G.J., Pietersen, D.W., Tolley, K.A., Weeber, J.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Genuine

Assessment rationale: There is moderate habitat loss within the small range of this species, but several large areas of intact habitat and protected areas still persist within the distribution (Geo Terra Image 2015). Considered Near Threatened in 2017 based on continuing destruction of habitat. However, most of the habitat loss in this area occurred prior to 1990 (approximately 49%), and the current rate of loss is substantial (approximately 4.4%) resulting in a downgrading of the status to Least Concern in 2018. Nevertheless, the species is now considered Near Threatened due to the ongoing habitat loss and the emerging threat of strip mining that would possibly affect about half the range, potentially causing declines in the quality and extent of EOO and AOO, as well as the number of individuals and subpopulations.

Scelotes gronovii, Velddrif, Western Cape province (© T. Ping).

Family **Scincidae**

Taxonomic notes: A phylogenetic assessment (Heideman et al. 2011) suggested that the subpopulation of *Scelotes gronovii* at Elands Bay and the nearby Steenboksfontein Farm may represent a distinct species. *Other important names*: none.

Distribution: Occurs in the southwestern coastal regions of South Africa (Bates et al. 2014) including Dassen Island (Branch 1998), reaching approximately 35 km inland. *EOO*: 7 810 km^2; *Distribution*: 3 010 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, inhabiting sparsely vegetated coastal dunes and strandveld, chiefly at elevations below 100 m a.s.l. (Baard 1988a). *Habitat*: Marine coastal, Shrubland.

Threats: Approximately 49% of the habitat has been transformed, primarily by agriculture with a minor contribution from urbanisation. The transformation is ongoing, with about ± 4.4% of the total being lost since 1990. There have been several new strip-mining applications that are in various stages of approval, and these mines would heavily impact the coastal margin and inland (https://www.protectthewestcoast.org/). The northern part of the range, where much of the habitat is currently still intact, intersects with this proposed mining area. This represents a significant emerging threat.

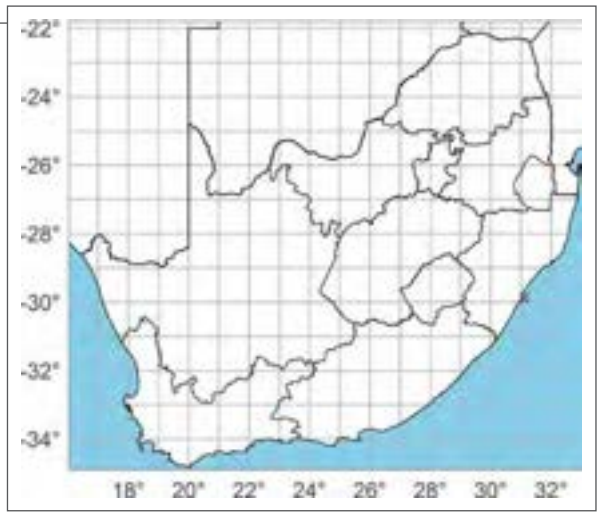
Population trend: The population is suspected to be in decline given the historical and ongoing habitat loss over a large portion of the range.

Conservation and research recommendations: The subpopulation of *S. gronovii* at Elands Bay and the nearby Steenboksfontein Farm may represent a distinct species (Heideman et al. 2011), and this requires further investigation. The potential impact from the proposed large-scale sand mining should be monitored.

Family **Scincidae**

Scelotes guentheri Boulenger, 1887

Günther's Dwarf Burrowing Skink



South African endemic

■ EX – Extinct (Global)

Assessors: Bauer, A.M., Conradie, W., Marais, J.

Previous Red List categories:
2018: Extinct (Global IUCN assessment).
2017: Extinct (Global IUCN assessment).
2014: Extinct (SARCA).

Assessment rationale: No individuals of this species have been found in over 130 years, despite directed searches at the probable type locality. There are also no captive specimens, so the species is considered Extinct (Broadley 1994).

Taxonomic notes: There has been confusion regarding the identity of this species in the past. Raw (1973) assigned specimens from the KwaZulu-Natal Midlands to *S. guentheri*, but these specimens were later described as *S. bourquini* (Broadley 1994). Because *S. guentheri* is known from only a single specimen, its taxonomic status remains uncertain, although most authors consider it valid (e.g., FitzSimons 1943; Broadley 1994; Branch 1998). The differences between these species are minor (the presence of a slightly higher ventral scale count, a postnasal scale and the absence of preanal pores) prompting Raw (2021) to suggest that *S. bourquini* should be synonymised with *S. guentheri*. However, this conclusion was based on the examination of limited material and therefore requires further data to confirm the result. *Other important names*: none.

Scelotes guentheri (© The Trustees of the Natural History Museum, London).

Family **Scincidae**

Scelotes guentheri (© The Trustees of the Natural History Museum, London).

Scelotes guentheri (© The Trustees of the Natural History Museum, London).

Distribution: Described by Boulenger in 1887 on the basis of a single specimen from 'Port Natal' near Durban. Has not been found again in more than 130 years, despite extensive surveys in the greater Durban area, including Marianhill, where the Reverend Henry Callaway is believed to have found the only specimen when traveling by ox-wagon from Pietermaritzburg (Marais & Bauer 2014b).

Country of occurrence: South Africa.

Habitat and ecology: The habitat preference and ecology of this species are unknown. *Habitat*: unknown.

Threats: Conversion of habitat in the Durban area for agriculture and human settlement are likely to be the cause of extinction (Bourquin 1988; Broadley 1994).

Population trend: No specimens have been identified in more than 130 years since the description of the species, despite directed searches.

Conservation and research recommendations: Given that details on the original collection locality and habitat are vague, additional surveys could be conducted in the greater Durban area to widen the search for this species.

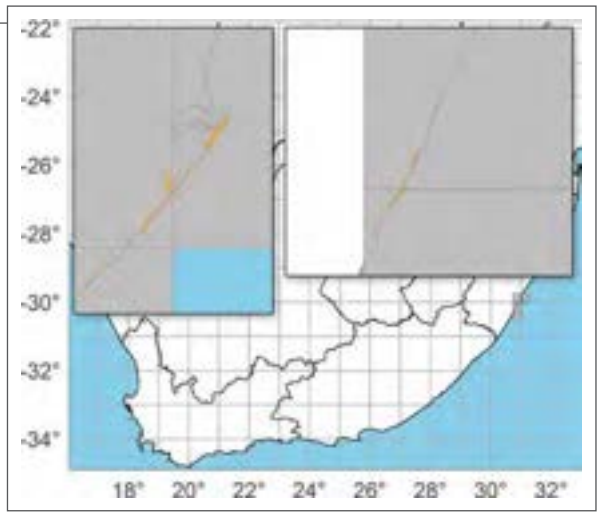
Scelotes inornatus (Smith, 1849)

Durban Dwarf Burrowing Skink

South African endemic

CR – Critically Endangered B1ab(i,ii,iii,iv,v) (Global)

Assessors: Alexander, G.J., Tolley, K., Weeber, J., Conradie, W., Marais, J., Bauer, A.M., Pietersen, D.W.



Previous Red List categories:
2018: Critically Endangered (Global IUCN assessment).
2017: Critically Endangered (Global IUCN assessment).
2014: Critically Endangered (SARCA).
2010: Endangered (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a very small EOO that is in decline with a severely fragmented distribution and ongoing threats. Development of roads, housing, industry and farmland has resulted in an observed and projected decline in EOO (this species is assumed to have become locally extinct at Stamford Hill, north of Durban Harbour) from a historical level of 280 km² to 133 km² in 1990 to 99 km² at present. In addition to the decline in habitat, coastal developments have also resulted in an observed, continuing and projected decline in the quality of habitat, and a decrease in the number of subpopulations and mature individuals. In addition, the AOO, as measured by the summed area of occupied 4 km² grid cells (IUCN Standards and Petitions Committee 2019) has declined from 176 km² historically, to ± 144 km² in around 1990 to ± 60 km² at present. The severe fragmentation of the distribution and the small size of the remaining habitat patches (ten fragments ranging from 0.01 to 1.7 km²) could result in a non-viable metapopulation and further loss of populations within the smallest fragments. Although this species was assessed as Endangered in 2010,

Scelotes inornatus, Bluff, KwaZulu-Natal province (© T. Ping).

Family **Scincidae**

the measurement of the EOO has been subsequently refined and falls under the Critically Endangered threshold.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Limited to the greater Durban area of KwaZulu-Natal province, South Africa, recorded from the Durban Harbour area in the north to Scottburgh in the south, and as far inland as Woodlands/Montclair. The current distribution is scattered over several extremely small remaining habitat fragments (ranging from 0.01 to 1.7 km^2), totalling just 5 km^2. This species previously occurred north of Durban Harbour at Stamford Hill, but that population is considered to be locally extinct as directed searches have not produced any observations in the last decade. Scattered records from neighbourhoods along the coast and in urbanised parts of Durban (e.g., The Bluff) as recent as 2016 suggest the species was once more widespread but given the lack of sufficient habitat and/or connectivity in those areas, these are no longer considered viable populations and are not part of the inferred distribution. The remaining habitat fragments are orientated linearly along the coastline. The habitat loss is apparent from the South African national land cover datasets from 1990 and 2013 (Geo Terra Image 2015, 2016). Comparison of these land cover data indicates that there is 14% natural land cover loss within the distribution of this species in this 23-year time period. This is much greater than the 2.3% natural land cover decrease on a national scale. The published localities (Broadley 1994) on the northern and southern banks of the Umgeni River are incorrect; no voucher specimens exist for these records, and they probably represent *Scelotes mossambicus*. *EOO*: 99 km^2; *AOO*: 60 km^2; *Distribution*: 5 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in Berea Red Sand soil associated with coastal forest lower than 70 m a.s.l. (Bourquin 2004) and within 4 km of the ocean. This species is a fossorial specialist that only inhabits loose coastal substrates. *Habitat*: Forest.

Threats: Development of roads, housing, industry and farmland have caused habitat destruction and severe fragmentation in coastal KwaZulu-Natal province (Geo Terra Image 2015, 2016), particularly around the Durban area (Skowno et al. 2019). Further fragmentation is projected given the continued urbanisation of the coastal region. The highly fragmented nature of the distribution, with very small patches separated by dozens of kilometres, could result in a non-viable metapopulation.

Population trend: Considering the loss of habitat and small remaining patches where this species occurs, it is in decline in terms of numbers of individuals and numbers of subpopulations. There are scattered records from neighbourhood gardens from parts of Durban (e.g., The Bluff), but these are not considered to be in viable populations. The population north of Durban Harbour is considered locally extinct.

Conservation and research recommendations: It is likely that habitat patches where this species occurs have been documented. Because the habitat decline is ongoing, information on ecology, genetics (e.g., subpopulation connectivity), habitat quality and potential threats is needed to mitigate the effects of habitat transformation and to inform the development of a plan to manage subpopulations. Because the subpopulations could rapidly decline, urgent action is needed to ensure protection of the remaining habitat patches. A mitigation measure that is being investigated by the Johannesburg City Parks and Zoo House is the establishment of a rescue population (I. du Plessis, pers. comm. 2022).

Family **Scincidae**

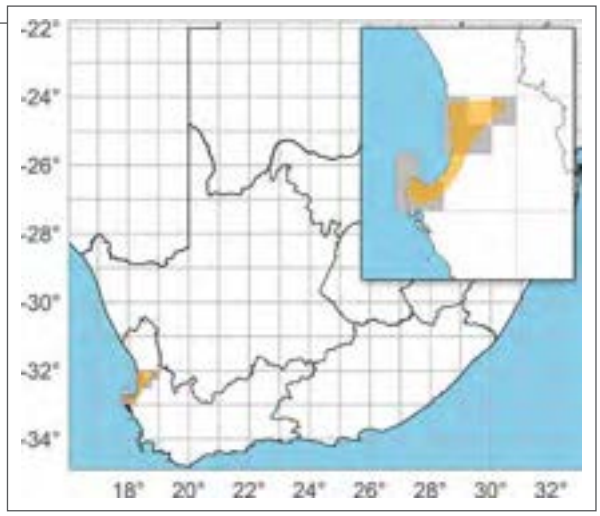
Scelotes kasneri FitzSimons, 1939

Kasner's Dwarf Burrowing Skink

South African endemic

EN – Endangered B1ab(ii,iii,iv) (Global)

Assessors: Conradie, W., Bauer, A.M., Pietersen, D.W., Alexander, G.J., Tolley, K.A., Weeber, J.



Previous Red List categories:

2018: Near Threatened (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Vulnerable (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a small range, over half of which is in a heavily impacted area, and it occurs in only a few protected areas. The majority of habitat loss is due to agriculture, with very minor losses due to coastal urban development. The intact habitat patches constitute 43% of the total range, and some of these patches are very small (<1 km^2) to over 700 km^2. It is considered severely fragmented and there has been an overall loss of habitat extent and quality across the majority of the range. Although previously assessed as Near Threatened, that assessment was based on an erroneously large estimate of the EOO.

Taxonomic notes: Although there appears to be genetic divergence between this species and the morphologically similar *S. montispectus* (Bauer et al. 2003), further investigation of the species boundaries between these taxa and related forms is required. A molecular phylogeny (Heideman et al. 2011) suggested that the subpopulation of *S. kasneri* at Elands Bay may represent a distinct species, requiring a taxonomic revision. *Other important names*: none.

Scelotes kasneri, Velddrif, Western Cape province (© T. Ping).

Family **Scincidae**

Scelotes kasneri, Velddrif, Western Cape province (© T. Ping).

Distribution: Occurs in the Western Cape province of South Africa, from the Cape Columbine area in the south, extending north to Lambert's Bay on the coast and Clanwilliam in the Cederberg. A record from Darling (south of the main distribution), that is currently assigned to *S. kasneri* (Marais & Bauer 2014c) is not included here, as it is likely to be a misidentified *S. bipes*. *EOO*: 4 480 km^2; *Distribution*: 2 710 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This is a fossorial species that occurs in vegetated dunes and sands along the coast, and in other areas under stones or debris. Its distribution is generally below 300 m a.s.l. elevation (Baard 1988b). *Habitat*: Shrubland.

Threats: More than half of the distribution is fragmented and degraded primarily due to agriculture and this habitat transformation is ongoing in the area. Coastal development can be considered only a very minor threat as it affects a small part of the range. However, there have been several new strip-mining applications that are in various stages of approval, which could heavily impact the coastal margin and inland (https://www.protectthewestcoast.org/). Because the mining footprint is likely to overlap with the range of this species, this could pose a further threat to this species in the immediate future.

Population trend: This population is severely fragmented as more than half the subpopulations are in small, isolated habitat patches that are unlikely to be connected through migration, and which might not be viable into the future. The population is suspected to be in decline due to the extreme habitat loss and the ongoing loss of small subpopulations.

Conservation and research recommendations: Further work to assess the taxonomic status of the Elands Bay population is required, as well as the species boundaries between *S. kasneri* and *S. montispectus*. The severity of the threats require assessment, particularly in terms of whether this species can persist in a heavily modified landscape and whether there is connectivity between the remaining intact habitat patches. There is an emerging plausible threat of mining, and this should be monitored for additional declines in habitat quality and extent.

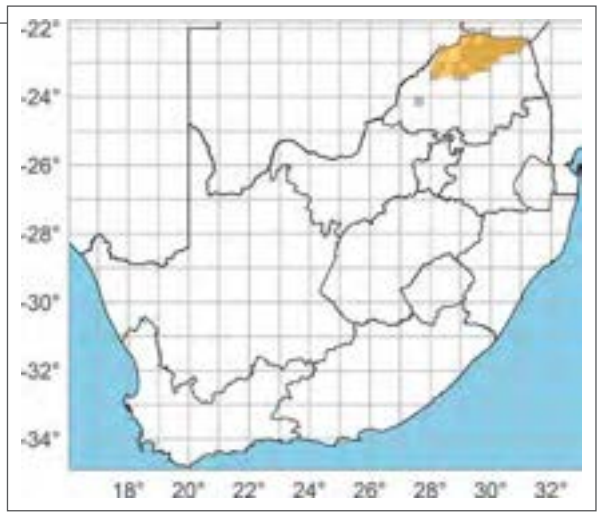
Family **Scincidae**

Scelotes limpopoensis FitzSimons, 1930

Limpopo Dwarf Burrowing Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W., Marais, J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Scelotes limpopoensis limpopoensis* – Least Concern (SARCA).
2014: *Scelotes limpopoensis albiventris* – Near Threatened (SARCA).

Subspecies included under this assessment:
- *Scelotes limpopoensis limpopoensis* FitzSimons, 1930.
- *Scelotes limpopoensis albiventris* Jacobsen, 1987.

Assessment rationale: This species has a relatively large distribution and although some areas have been transformed by agriculture and urbanisation, most of the distribution is not heavily impacted. It also occurs in several protected areas and is considered well protected.

Taxonomic notes: Two subspecies of *S. limpopoensis* are recognised, namely *S. l. limpopoensis* and *S. l. albiventris*, with sympatric distributions. The subspecies are morphologically distinct and might represent separate species. *Other important names*: none.

Distribution: Occurs in southern Africa across the central Limpopo River Valley and surrounding regions (Jacobsen 1989; Branch 1998). The two subspecies are sympatric in South Africa. The subspecies *S. l. limpopoensis* is distributed in northern

Scelotes limpopoensis albiventris, Soutpansberg, Limpopo province (© R. van Huyssteen).

Family **Scincidae**

Scelotes limpopoensis albiventris, Blouberg, Limpopo province (© L. Verburgt).

Scelotes limpopoensis limpopoensis, Pontdrift, Limpopo province (© L. Verburgt).

Limpopo province from the extreme western portion of the Kruger National Park through the Soutpansberg area to the Botswana border and southwards to the Waterberg. *Scelotes l. albiventris* is more restricted, occurring from Blouberg eastwards to the western Soutpansberg. The subspecies are syntopic in some areas. *EOO*: 39 600 km^2; *Distribution*: 27 400 km^2.

Countries of occurrence: Botswana, South Africa, Zimbabwe.

Habitat and ecology: A fossorial species, inhabiting deep aeolian sand in Woodland and Mesic Savanna at elevations of 300–1 100 m a.s.l. (Jacobsen 1987b, 1989; Branch & Jacobsen 1988). *Habitat*: Savanna.

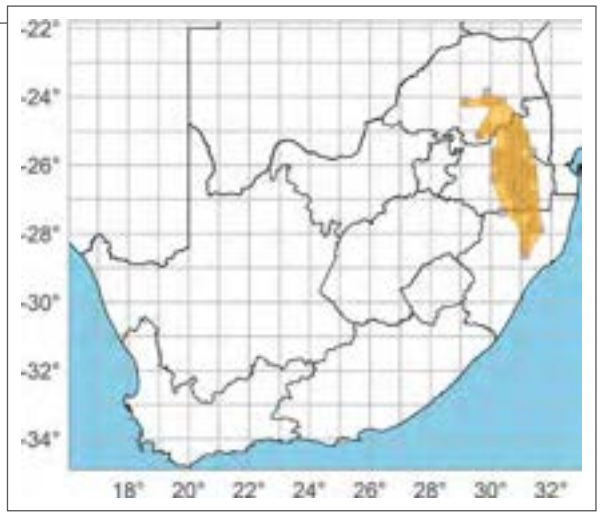
Threats: There are no substantial threats.

Population trend: The population size is assumed to be stable because this is a fairly widespread and common species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: Research should be conducted on the taxonomy and distribution of the two subspecies, including a phylogenetic analysis.

Scelotes mirus (Roux, 1907)

Montane Dwarf Burrowing Skink



Regional endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs in northeastern South Africa, from southern Limpopo province, extending southwards into northern KwaZulu-Natal province and western Eswatini. Records from southern Kruger National Park (see Marais & Bauer 2014d) are incorrect and refer to *S. mossambicus*. *EOO*: 69 000 km^2; *Distribution*: 56 700 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Inhabits rocky Montane Grasslands and scrubby Woodlands at elevations of 800–2 000 m a.s.l. (Jacobsen 1989; Bourquin 2004). *Habitat*: Grassland, Savanna.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

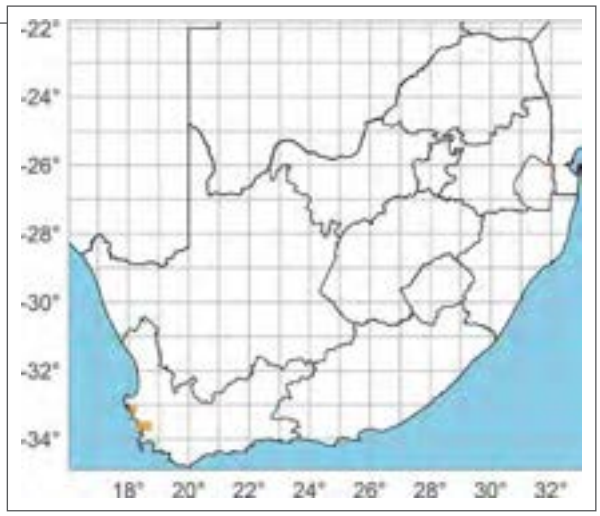
Scelotes mirus, Graskop, Mpumalanga province (© C.R. Hundermark).

Scelotes mirus, Kaapschehoop, Mpumalanga province (© L. Kemp).

Family **Scincidae**

Scelotes montispectus Bauer, Whiting & Sadlier, 2003

Bloubergstrand Dwarf Burrowing Skink



South African endemic

NT – Near Threatened (B1biii) (Global)

Assessors: Bauer, A.M., Conradie, W., Marais, J.

Previous Red List categories:

2018: Near Threatened (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Assessment rationale: There is incomplete knowledge of distribution, habitat requirements, population size, population structure and threats. Most localities where *Scelotes montispectus* have been recorded are in protected areas. There are too few records to estimate distribution with confidence, but the minimum EOO has been estimated based on the presence of records in two quarter degree grid cells. The overall range is most likely small and probably within areas that are transformed. It is therefore suspected that there is an ongoing decline in the quality of habitat and a Near Threatened category is precautionary. *EOO*: 4 100 km^2; *Distribution*: Not estimated.

Taxonomic notes: Although relatively high genetic divergence between *S. montispectus* and the related *S. kasneri* has been recorded (Bauer et al. 2003), there is not strong phylogenetic support for species-level differences (Heideman et al. 2011). Regardless, *S. montispectus* is currently considered distinct from

Scelotes montispectus, Langebaan, Western Cape province (© C. & S. Dorse).

Scelotes montispectus, West Coast National Park, Western Cape province (© N. Evans).

S. kasneri based on small morphological differences and geographical separation (Heideman et al. 2011). *Other important names*: none.

Distribution: Occurs on the west coast of the Western Cape province, South Africa, where it has been recorded from only a few areas from beach-front dunes extending to about 14 km inland. *EOO*: 3 150 km^2; *Distribution*: 1 460 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Inhabits sparsely vegetated coastal sands (Bauer et al. 2003). *Habitat*: Marine coastal, Shrubland.

Threats: There has been habitat alteration from agriculture across the area that transforms the sandy soils, which may pose a threat to this species. The extent and rate of habitat loss cannot be inferred due to the uncertainty with respect to the extent of the distribution.

Population trend: Because of uncertainty regarding the extent of the distribution, the population trend is unknown. However, there has been substantial habitat modification outside of protected areas and this could have impacted the population of this lizard, and it is possibly in decline.

Conservation and research recommendations: Surveys are required to better assess the distribution of this species, especially in terms of habitat quality changes in the coastal regions. Given the low genetic and morphological differences recorded, additional work regarding this species' relationship to *S. kasneri* appears to be required.

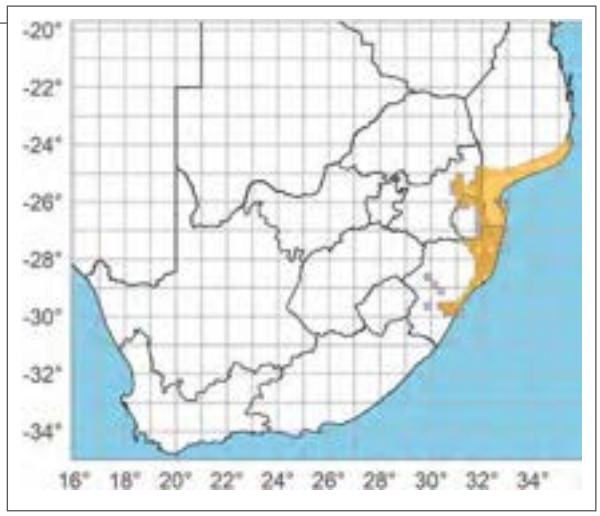
Family **Scincidae**

Scelotes mossambicus (Peters, 1882)

Mozambique Dwarf Burrowing Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Bauer, A.M., Pietersen, D.W., Weeber, J., Tolley, K.A., Alexander, G.J.



Previous Red List categories:

2022: Least Concern (Global IUCN assessment).
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: This species is often confused with *Scelotes fitzsimonsi* due to their morphological similarity, particularly where they are sympatric in KwaZulu-Natal province, South Africa. The coastal and inland populations show differences in colouration and occur in different habitats. *Other important names*: none.

Distribution: Occurs from eastern South Africa into southern Mozambique as far north as Maxixe. In South Africa, it ranges from central, coastal KwaZulu-Natal province northwards, through Eswatini and into northern Mpumalanga province (Jacobsen 1989; Broadley 1994). There are scattered, historical records inland in KwaZulu-Natal province (Bourquin 2004), and these records need confirmation. In addition, there is a historical record from Angoche on the northern Mozambique coast (Broadley 1994), approximately 1 100 km north of Maxixe that requires confirmation. *EOO*: 116 000 km^2; *Distribution*: 68 500 km^2.

Countries of occurrence: Eswatini, Mozambique, South Africa.

Scelotes mossambicus, Durban, KwaZulu-Natal province (© T. Ping).

Scelotes mossambicus, Mount Moreland, KwaZulu-Natal province (© T. Ping).

Habitat and ecology: Inhabits rocky, grassy Savanna and coastal sand from the coast to 1 300 m a.s.l. (Pienaar et al. 1983; Jacobsen 1989; Bourquin 2004). The species tolerates some habitat disturbance. *Habitat*: Forest, Savanna.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with a large proportion of the distribution in areas that are not significantly impacted by habitat transformation.

Conservation and research recommendations: Records from Mozambique are scattered and few in number, and improved data would allow for a better assessment of the global distribution. Further investigation of the differences between coastal and inland populations is warranted.

Family **Scincidae**

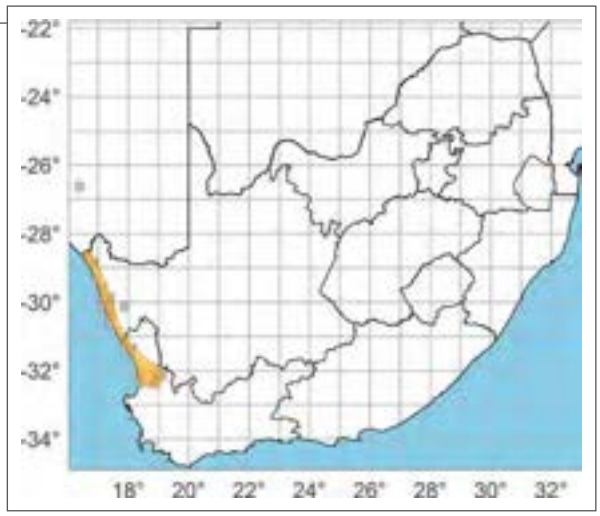
Scelotes sexlineatus (Harlan, 1824)

Striped Dwarf Burrowing Skink

South African near-endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Fairly widespread and common with no major threats at present. Approximately 20% of its original habitat has been lost due to agriculture, but this occurred primarily before 1990. Although this lizard occurs in an area where the mining footprint might expand in the near future, its EOO is currently large enough to buffer against the impact of the plausible mining operations that could rapidly transform the habitat.

Taxonomic notes: No issues. *Other important names*: none.

Distribution: Occurs along the west coast of South Africa from north of Cape Town, extending into southern Namibia. The Namibian portion of the distribution is represented by a single record (Bauer 2019) and this is included in the EOO estimate. Several inland records from the western Karoo are questionable (see Marais & Bauer 2014e) and have been excluded. *EOO*: 54 800 km^2; *Distribution*: 16 000 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Inhabits sandy soils in Succulent Karoo and Fynbos biomes, from sea level to approximately 500 m a.s.l. *Habitat*: Shrubland.

Scelotes sexlineatus, West Coast, Western Cape province (© W.R. Branch).

Scelotes sexlineatus, Noup, Northern Cape province (© G. Alexander).

Threats: Prior to 1990, this species lost approximately 20% of its habitat to agriculture with some smaller impacts from mining (Skowno et al. 2020). There is the emerging threat of strip mining, given that there have been several new strip-mining applications that are in various stages of approval, which could heavily impact the coastal margin and inland (https://www.protectthewestcoast.org/). An increase in mining could pose some threat to this species in the immediate future, but the EOO is much larger than the proposed mining footprint and this threat is likely to be relevant for a small part of the range.

Population trend: This lizard occurs mainly in an arid coastal region and although there has been some habitat loss due to agriculture, most of the overall distribution has intact habitat. Therefore, it is suspected that any local population declines are not significant enough to put the species at risk of extinction. Despite this, an increased mining footprint could cause population declines in the future.

Conservation and research recommendations: Research on the extent of emerging pressures is required to assess population trends. Approximately 20% of the distribution has been impacted by habitat loss due to agriculture, but the threat of mining in the future is plausible. Research on the extent of emerging pressures is required to assess population trends, i.e., the expanding mining footprint should be monitored to assess further declines in habitat quality and extent. The Namibian portion of the distribution is represented by a single record (Bauer 2019), so additional records from Namibia are needed.

Family **Scincidae**

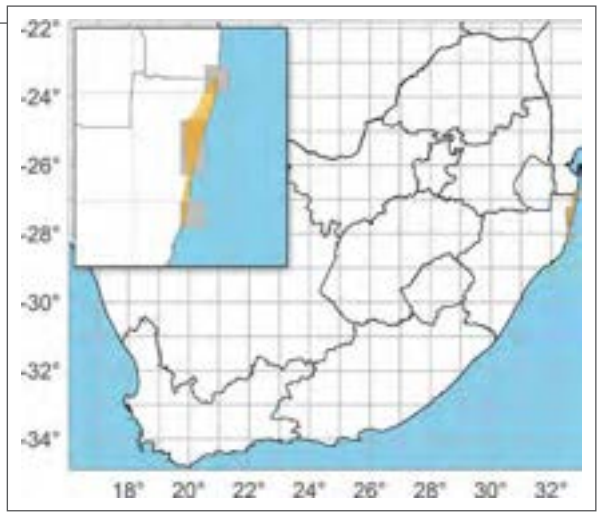
Scelotes vestigifer Broadley, 1994

Coastal Dwarf Burrowing Skink

South African near-endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a small range with about 30% falling within a large, protected area, where it is abundant, and is therefore considered Least Concern. However, the emerging threat of socioeconomically driven land invasion by local communities within the small range of this species should be monitored. If this threat becomes active, and given the small EOO, this species could rapidly become threatened.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: This species has a small range along the KwaZulu-Natal coast in South Africa, extending northwards, marginally into southern Mozambique (Broadley 1994; Jordaan 2021). Much of this species' distribution is within the iSimangaliso Wetland Park and World Heritage Site, which is a large, protected area. *EOO*: 4 100 km²; *Distribution*: 2 400 km².

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Occurs in sandy coastal dunes at elevations lower than 100 m a.s.l. (Bourquin 2004). *Habitat*: Forest, Coastal sand dunes.

Scelotes vestigifer, Cape Vidal, KwaZulu-Natal province (© T. Ping).

Threats: A small part of the geographic range is heavily impacted by urbanisation, small-scale agriculture and silviculture. About 30% of the range falls within natural habitat inside the iSimangaliso Wetland Park and World Heritage Site, and therefore the population had been considered secure. Despite the official protection status, the park has become vulnerable to the threat of socio-economically driven land invasion by local communities, and this could be an emerging threat to species. Given that other protected areas in South Africa recently have been de-gazetted due to land invasions in favour of informal human settlement (e.g., Western Cape Government 2022), this is a plausible emerging threat.

Population trend: The species is not considered to be in decline at present, as most of the range is within a protected area (iSimangaliso Wetland Park). There have probably been local declines outside iSimangaliso Wetland Park, as the area beyond the park borders is heavily transformed. Given that most of the range is within natural, untransformed habitat, the overall population is considered to be stable at present. Local declines outside the protected area are unlikely to pose an elevated extinction risk.

Conservation and research recommendations: Although well protected within iSimangaliso Wetland Park, the extent of the distribution outside the protected area should be investigated. In addition, there is an emerging threat of socioeconomically driven land invasion by local communities within the protected area where this species primarily occurs. Changes in land use and potential rapid habitat destruction will require careful monitoring.

Family **Scincidae**

Trachylepis capensis (Gray, 1831)

Cape Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

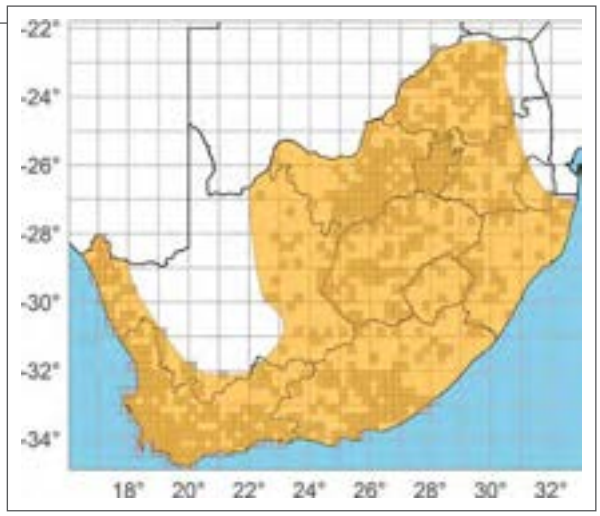
Assessment rationale: A very common and widespread species with no substantial threats.

Taxonomic notes: There are two isolated subpopulations, but the one from western Zambia is based on a single specimen from the Bulawayo Museum, Zimbabwe (Broadley 1971a). There exists confusion between this species and *T. occidentalis*, particularly where they are sympatric. *Other important names*: *Mabuya capensis*.

Distribution: Widespread in southern Africa, although subpopulations from Inyanga Mountain in Zimbabwe and the Liuwa Plains in Zambia appear to be isolated (Branch 1998; Broadley 2000). The species is widespread in the region but is absent from the arid central Karoo and Kalahari regions. It occurs in the lower elevation areas of Lesotho and in northwest Eswatini. In various parts of the range, there are some notable gaps in the distribution records. *EOO*: 1 404 000 km^2; *Distribution*: 1 022 000 km^2.

Countries of occurrence: Botswana, Eswatini, Lesotho, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Absent from arid regions, but widespread in the more mesic habitats, across a variety of biomes and substrates including rocky areas, open veld, holes in disused termite mounds and in peri-urban settings (De Waal 1978; Jacobsen 1989; Branch 1998). May dig burrows at the base of vegetation or rocks and is also fond of areas with mats of dead leaves (Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.



Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with a large portion of the range that is not significantly impacted by habitat transformation.

Conservation and research recommendations: The two isolated subpopulations warrant taxonomic work.

Trachylepis capensis, Tokai, Western Cape province (© T. Ping).

Trachylepis capensis, plain form, Suikerbosrand, Gauteng province (© G. Alexander).

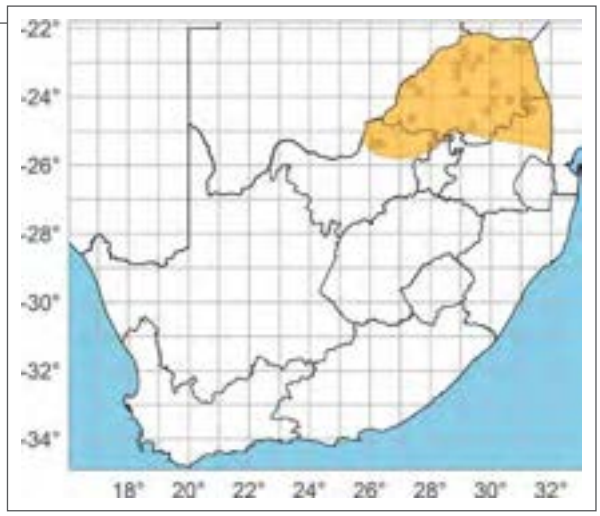
Family **Scincidae**

Trachylepis damarana (Peters, 1870)

Common Variable Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Bauer, A.M.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Assessment rationale: This is a very common and widespread species with no known substantial threats.

Taxonomic notes: Peters (1870) described *Euprepes damarana* (=*Trachylepis damarana*), which was subsequently synonymised with *Trachylepis varia* (Loveridge 1936). Based on genetics, lepidosis and colouration, Weinell and Bauer (2018) reinstated *T. damarana*. *Other important names*: *Mabuya varia*; *Trachylepis varia*.

Distribution: Occurs in northern Namibia, southeastern Angola, western Zambia, northern and eastern Botswana, Zimbabwe, northeastern South Africa and western Mozambique. Although recorded from western Mozambique (Manica Plateau region), it could extend further east and south (e.g., into the Zambezi River Valley; see Weinell & Bauer 2018). In South Africa, it occurs across Limpopo province, extending into northern North West and Mpumalanga provinces. *EOO*: 194 000 km²; *Distribution*: 166 000 km².

Countries of occurrence: Angola, Botswana, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: This species occurs in open habitats on rocky, gravelly and sandy substrates. *Habitat*: Savanna.

Threats: Widespread across a region that has some moderate habitat alteration, but this probably poses relatively little threat to this species.

Population trend: The population is considered stable.

Conservation and research recommendations: No conservation actions recommended.

Trachylepis damarana, Medike, Limpopo province (© R. van Huyssteen).

Trachylepis damarana, Hoedspruit, Limpopo province (© R. van Huyssteen).

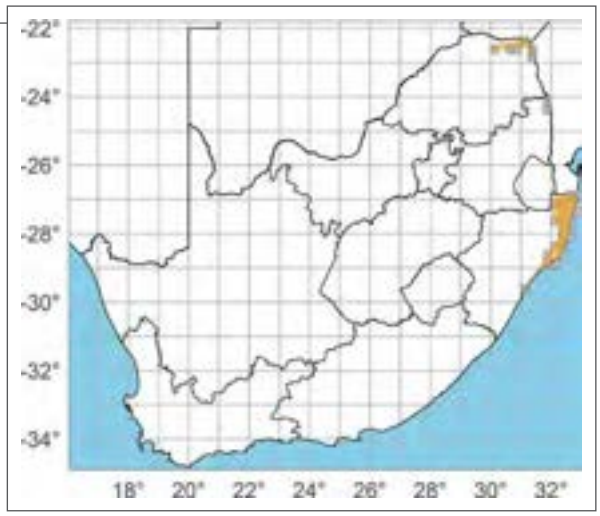
Family **Scincidae**

Trachylepis depressa (Peters, 1854)

Eastern Coastal Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Very common and widespread with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: *Mabuya depressa*.

Distribution: From southeastern Zimbabwe through the Mozambique plain and coastal Mozambique (Branch 1998; Broadley 2000), extending along coastal northeastern South Africa to just north of Durban. The distribution also extends into South Africa in the extreme northeastern and eastern Limpopo province (Branch 1998; Broadley 2000). *EOO*: 130 000 km²; *Distribution*: 13 100 km².

Countries of occurrence: Mozambique, South Africa, Zimbabwe.

Habitat and ecology: A terrestrial species that occurs on sandy soils in Coastal Scrub, Savanna and riverine areas (Branch 1998). *Habitat*: Coastal vegetation, Forest, Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population is regarded as being stable.

Conservation and research recommendations: No recommendations.

Trachylepis depressa, Inhambane, Mozambique (© L. Kemp).

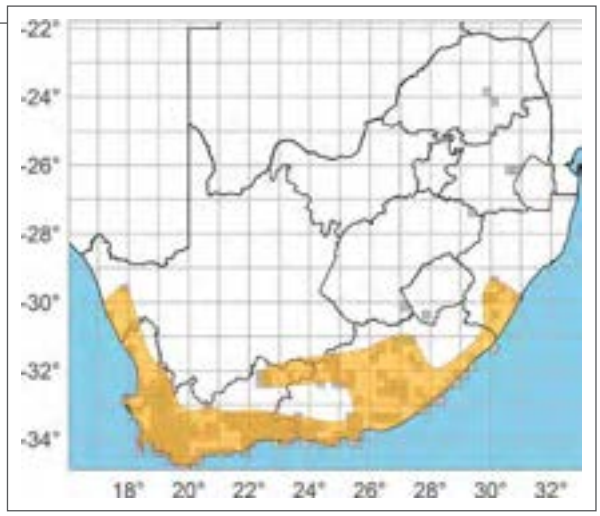
Trachylepis homalocephala (Wiegmann, 1828)

Red-sided Skink

Regional endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Masterson, G.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A very widespread and common species with no major threats.

Taxonomic notes: There are several previously recognised subspecies (*T. h. depressa, T. h. peringueyi, T. h. smithi*), and of those, *T. depressa* Peters, 1854 has been reinstated as a full species (Branch 1998; Broadley 2000). A phylogenetic analysis revealed some genetic differences within *T. homalocephala* for subpopulations along the west coast of South Africa (Weinell et al. 2019) and these are possibly referable to the subspecies *T. h. homalocephala* (southwest coast) and *T. homalocephala peringueyi* (central west coast). *Other important names*: *Mabuya homalocephala*.

Distribution: Has a widespread distribution along the southern and eastern parts of South Africa, from coastal sandy areas to mountainous areas several hundred kilometres inland. Occurs from the west coast of South Africa, eastwards and northeastwards into KwaZulu-Natal province (De Waal 1978; Jacobsen 1989; Branch 1998; Broadley 2000). Records from the Free State, Limpopo and Mpumalanga provinces are scattered, and there is a single record from the lower elevations of southern Lesotho, which might represent subpopulations. *EOO*: 1 030 000 km^2; *Distribution*: 227 000 km^2.

Countries of occurrence: Lesotho, South Africa.

Habitat and ecology: This species occurs in a wide range of habitats, from sea level up to ± 1 500 m a.s.l. (Jacobsen 1989; Branch 1998). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: This species occurs in some areas where there is habitat transformation, but this is not considered a significant threat.

Trachylepis homalocephala, female colouration, Baviaanskloof, Eastern Cape province (© L. Kemp).

Trachylepis homalocephala, female colouration, Baviaanskloof, Eastern Cape province (© C. Keates).

Family **Scincidae**

Trachylepis homalocephala, male colouration, Makhanda, Eastern Cape province (© L. Kemp).

Population trend: The population is considered stable, given that this skink is widespread and abundant, and most of the range is not significantly impacted by habitat loss.

Conservation and research recommendations: The status of the subspecies and the outlying subpopulations should be investigated through a comprehensive phylogenetic study.

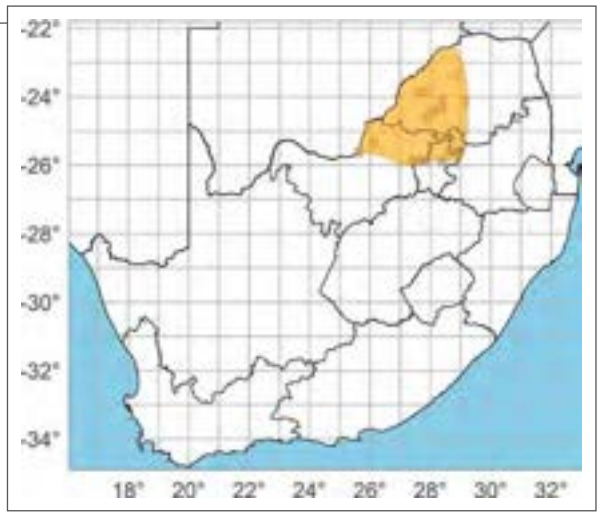
Trachylepis laevigata (Peters, 1869)

Striped Variable Skink

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Tolley, K.A., Alexander, G.J., Pietersen, D.W., Weeber, J., Bauer, A.M.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).

Assessment rationale: Although previously assessed as Data Deficient, new occurrence records have now allowed for the distribution and threats to be evaluated. This species is now known to be widespread in northern South Africa in an area with few significant threats.

Taxonomic notes: Peters (1869) described *Euprepes laevigatus* (= *Trachylepis laevigata*) from Gerlachshoop in Limpopo province, South Africa. The species was later synonymised with *T. varia*. Based on genetics, lepidosis and colouration, Weinell and Bauer (2018) reinstated *T. laevigata* as a full species. This species appears to be sometimes confused with *T. varia* and *T. damarana* as shown by a DNA barcoding study (Stephens et al. 2022). *Other important names*: *Trachylepis varia*.

Distribution: This species occurs in northwestern Limpopo and northern North West provinces, South Africa. Although previously thought to occur only within the Waterberg Massif (Weinell & Bauer 2018), new locality records show the species is more widespread. New records from iNaturalist show the species occurs in Gauteng province, and probably as far east as Blyde River in Mpumalanga province. The latter locality

Trachylepis laevigata, Magaliesberg, Gauteng province (© L. Kemp).

Family **Scincidae**

Trachylepis laevigata, Magaliesberg, Gauteng province (© L. Kemp).

represents a 200 km gap in the records, so the eastern limits of the distribution are unclear. It is possible that it also occurs in Botswana as some records are close to the border. *EOO*: 131 000 km^2; *Distribution*: 88 700 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species occurs on open, rocky and gravelly substrates in mountainous regions. *Habitat*: Savanna.

Threats: Although there is some habitat alteration in the area, the impact of this is considered to be negligible for this species.

Population trend: The population size is assumed to be stable because this is a widespread species and is suspected to be abundant. Most of the range is not significantly impacted by habitat transformation.

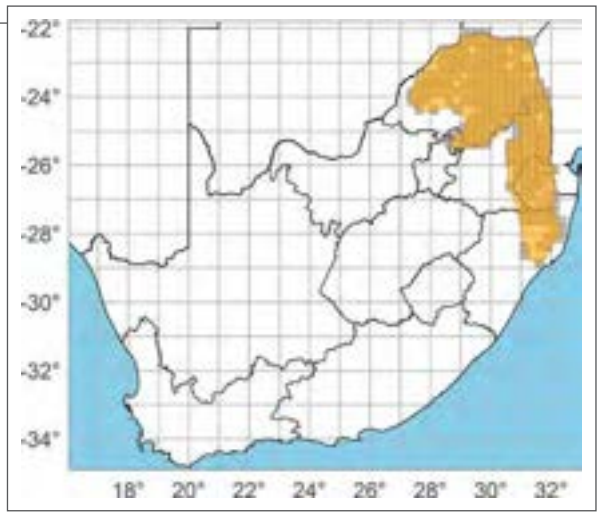
Conservation and research recommendations: Recent improvements in locality information have shown that this species is more widespread than had been originally thought. Firstly, new records from targeted surveys and from iNaturalist have now been included in the estimation of distribution (Stephens et al. 2022). Secondly, there were a number of existing records of this species that had been incorrectly identified as other similar looking species. These newly corrected records together with the new data have allowed for an estimate of the distribution to be made with confidence (Stephens et al. 2022). Despite this, the eastern limits of the distribution are not known, and this skink potentially also occurs in Botswana. Thus, additional locality records confirmed by DNA barcoding would assist to provide a better estimate of distribution.

Trachylepis margaritifer (Peters, 1854)

Rainbow Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: This is a common and widespread species with no major threats.

Taxonomic notes: No notable issues. *Other important names*: *Mabuya quinquetaeniata margaritifer*; *Mabuya margaritifera*.

Distribution: Widespread in eastern and southern Africa (Broadley & Bauer 1998; Broadley 2000). Regionally it is widespread in the northeastern areas, from Limpopo province, through Mpumalanga province and Eswatini, extending into the mountainous areas of northern KwaZulu-Natal province. *EOO*: 226 000 km²; *Distribution*: 169 000 km².

Countries of occurrence: Botswana, Eswatini, Kenya, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: A strictly rupicolous species that can occur at high densities on rock outcrops and is known to inhabit manufactured structures. Occurs in Coastal Scrub and Savanna up to 1 500 m a.s.l. (Broadley & Bauer 1998; Broadley 2000). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species. Most of the range is not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

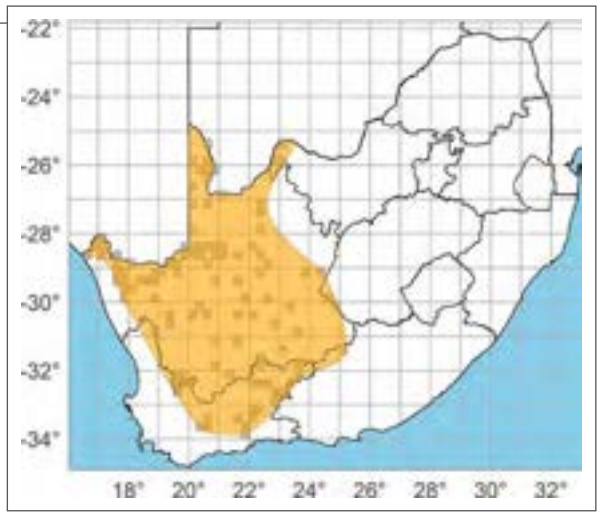
Trachylepis margaritifer, female colouration, Vivo, Limpopo province (© C. & S. Dorse).

Trachylepis margaritifer, male colouration, Zimbabwe (© L. Verburgt).

Family **Scincidae**

Trachylepis occidentalis (Peters, 1867)

Western Three-striped Skink



LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common in South Africa, with no substantial threats. It is also found in several protected areas.

Taxonomic notes: No notable taxonomic issues. However, this species is difficult to morphologically distinguish from *T. capensis*, particularly where they are sympatric. *Other important names*: *Mabuya occidentalis*.

Distribution: Occurs in the western and central parts of southern Africa. In South Africa, it is distributed throughout the western half of the country (Broadley 2000), although it is absent from the extreme southwest with the southern extent bounded by the Cape Fold Mountains. *EOO*: 559 000 km²; *Distribution*: 384 000 km².

Countries of occurrence: Angola, Botswana, Namibia, South Africa.

Habitat and ecology: Occurs in Arid Scrub and Karroid Veld, to elevations of 1 200 m a.s.l. Uses burrows, tree clumps and bushes for refuge (Branch 1998; Broadley 2000). *Habitat*: Desert, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with large portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Trachylepis occidentalis, Murraysburg, Western Cape province (© L. Kemp).

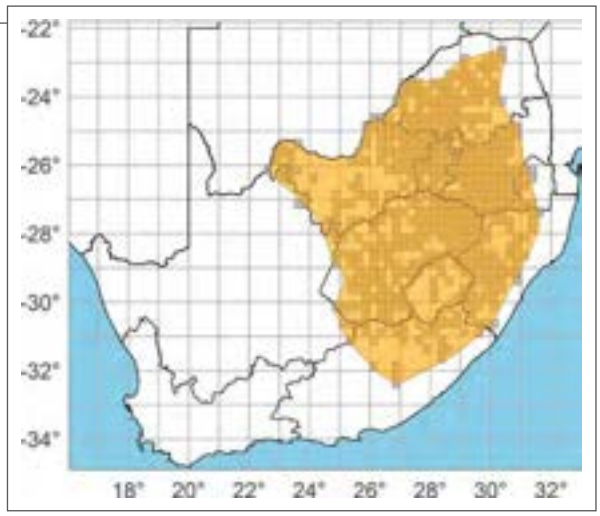
Family **Scincidae**

Trachylepis punctatissima (Smith, 1849)

Speckled Rock Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and abundant, with no major threats, occurring in numerous protected areas, and inhabits urban and peri-urban environments.

Taxonomic notes: Although there are some morphological and colour differences between *T. sparsa* and *T. punctatissima* (Broadley 2000), these features do overlap between the two species, and the taxa are not genetically distinct (Stephens et al. 2022). Therefore, *T. sparsa* may not represent a valid species. *Other important names*: *Mabuya striata punctatissima*; *Mabuya punctatissima*.

Distribution: Widespread, occurring over the high-elevation, central, northern and eastern parts of South Africa, extending into the central-eastern regions of southern Africa. There is an isolated population in the eastern highlands of Zimbabwe and adjoining regions of Mozambique (Broadley 2000). *EOO*: 624 000 km^2; *Distribution*: 547 000 km^2.

Countries of occurrence: Botswana, Eswatini, Lesotho, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Rupicolous and semi-arboreal, readily adapting to peri-urban environments. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, which easily adapts to habitat transformation, including by colonising anthropogenic structures.

Conservation and research recommendations: The taxonomy of the broader *T. striata* group, which includes *T. punctatissima* and *T. sparsa*, requires further investigation.

Trachylepis punctatissima, Impendle, KwaZulu-Natal province (© T. Ping).

Family **Scincidae**

Trachylepis punctulata (Bocage, 1872)

Speckled Sand Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

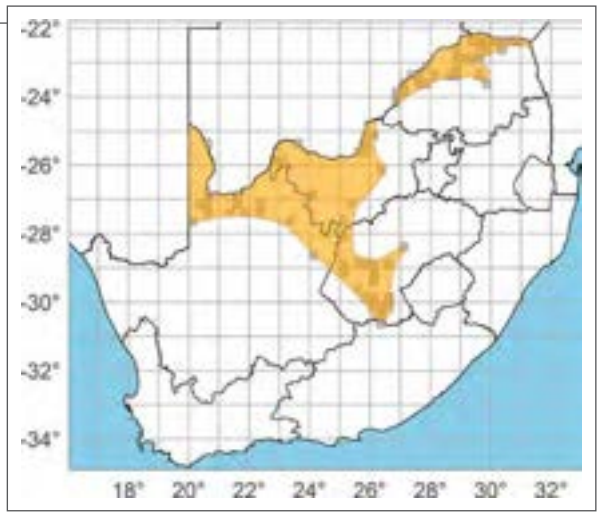
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This is a common and widespread species, with no major threats.

Taxonomic notes: Populations in the northern parts of the distribution may represent a distinct lineage and further sampling is required to better define the geographic and genetic limits of the species (Portik & Bauer 2012). The distribution appears to overlap with that of *T. variegata* in the south, but this may be due to incorrect identifications. *Other important names*: *Mabuya variegata punctulata*; *Mabuya punctulata*.

Distribution: Widespread across most of southern Africa, extending into southern Angola and western Zambia (Branch 1998; Broadley 2000; Portik & Bauer 2012). Within South Africa it occurs in the northeast, extending westward to the Kalahari region and southwards to the Free State province. An isolated record from the eastern Free State province (Masterson 2014a) is considered doubtful. *EOO*: 609 000 km^2; *Distribution*: 201 000 km^2.

Countries of occurrence: Angola, Botswana, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.



Habitat and ecology: A terrestrial species that occurs in arid regions (less than 500 mm rainfall per annum), mainly on deep, sandy soils and occasionally on rocky outcrops (Branch 1998; Broadley 2000), at elevations as high as 1 300 m a.s.l. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with large portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The overlap in distribution with *T. variegata* requires investigation to assess if the apparent sympatry is the result of incorrect identifications.

Trachylepis punctulata, Lephalale, Limpopo province (© L. Verburgt).

Trachylepis punctulata, north of Vivo, Limpopo province (© R.I. Stander).

Family **Scincidae**

Trachylepis sparsa (Mertens, 1954)

Karasburg Tree Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This is a very common species with a moderate-sized range in South Africa, with no major threats. It appears to tolerate moderate levels of anthropogenic habitat change.

Taxonomic notes: Although there are some morphological and colour differences between *T. sparsa* and *T. punctatissima* (Broadley 2000), these features overlap, and the taxa are not genetically distinct (Stephens et al. 2022). Therefore, *T. sparsa* may not represent a valid species. *Other important names*: *Mabuya striata sparsa*; *Mabuya sparsa*.

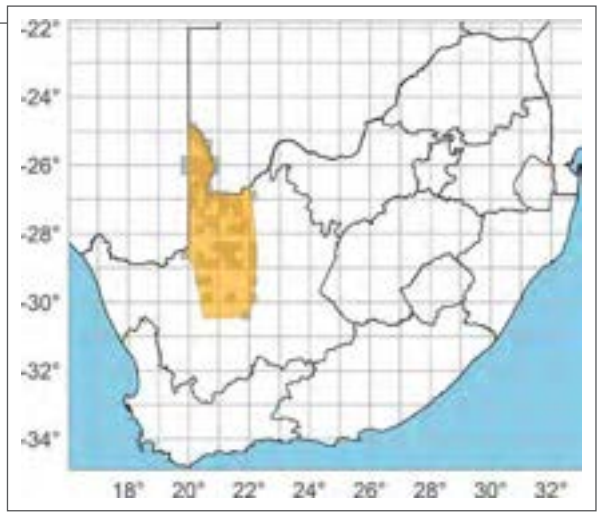
Distribution: Occurs across the arid west-central regions of southern Africa (Broadley 2000). Within South Africa, it is distributed in the central and northern parts of the Northern Cape province. *EOO*: 110 000 km²; *Distribution*: 93 000 km².

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: A semi-arboreal species, often sheltering in large trees but also uses gravelly areas in Arid Savanna and Karroid Veld. It has been recorded inhabiting Sociable Weaver (*Philetairus socius*) nests and rock piles (Broadley 2000). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation and is commensal with humans, the population size is not thought to have declined significantly.



Conservation and research recommendations: Intensive range-wide sampling, including of topotypical material, is required to assess the taxonomic relationship between *T. sparsa* and *T. punctatissima*.

Trachylepis sparsa, Groblershoop, Northern Cape province (© D.W. Pietersen).

Family **Scincidae**

Trachylepis spilogaster (Peters, 1882)

Kalahari Tree Skink

LC – Least Concern (Regional)

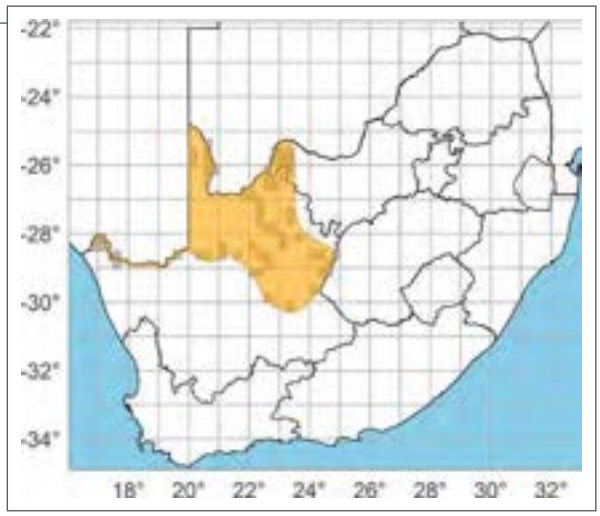
Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread and abundant, occurring in areas that are not substantially impacted by habitat transformation.

Taxonomic notes: The morphological similarity between *T. spilogaster* and *T. punctatissima* has resulted in the misidentification of specimens in areas of sympatry in the Kalahari region of the North West province (Stephens et al. 2022), which has caused confusion regarding the delineation of the eastern edge of the distribution (Masterson 2014b). In addition, southeastern Angolan and northeastern Namibian populations might be distinct (Conradie et al. 2016, see also Weinell et al. 2019). *Other important names*: *Mabuya spilogaster*.

Trachylepis spilogaster, Witsand Nature Reserve, Northern Cape province (© L. Kemp).



Distribution: This species is distributed across the arid western regions of southern Africa (Branch 1998; Broadley 2000). Within South Africa it occurs in the arid northern and central areas, extending into the Kalahari region and westward along the Orange River Valley. An apparent introduced population exists in McDougall's Bay near Port Nolloth (iNaturalist: 60935635). *EOO*: 318 000 km^2; *Distribution*: 151 000 km^2.

Countries of occurrence: Angola, Botswana, Namibia, South Africa.

Habitat and ecology: An arboreal species found on trees in Arid Savanna, up to elevations of 1 000 m a.s.l. Appears to be tolerant of some habitat alteration (Bauer et al. 1993). *Habitat*: Desert, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: An assessment of the presumed areas of sympatry between this species and *T. punctatissima* is needed. The southeastern Angolan and northeastern Namibian populations require a taxonomic assessment that is informed by genetic and morphological data.

Trachylepis striata (Peters, 1844)

Striped Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

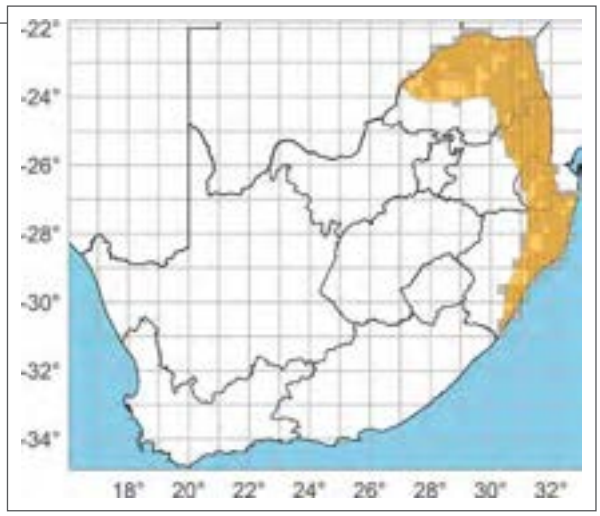
Assessment rationale: This species is widespread, common, and tolerant of habitat transformation.

Taxonomic notes: *Trachylepis striata punctatissima*, *T. s. wahlbergii* and *T. s. sparsa* were elevated to full species by Broadley (2000), despite intergrades between these three taxa having been reported from some parts of their overlapping ranges. A phylogenetic analysis suggested that the two most widespread members of the *T. striata* species complex – *T. striata* and *T. wahlbergii* – may not be genetically distinct (Castiglia et al. 2006). However, this study was based on a small sample size and only investigated a single gene region. A subsequent, phylogenetic study appears to support this hypothesis (Weinell et al. 2019), and the entire complex requires re-examination (Marques et al. 2018). Many of the South African records of this species are misidentifications of *T. punctatissima*, particularly where the ranges of the two species overlap in Limpopo and Mpumalanga provinces (Stephens et al. 2022). *Other important names*: *Mabuya striata*.

Distribution: Occurs across much of eastern sub-Saharan Africa, ranging from South Africa to Ethiopia in the north. In South Africa, it is distributed in the northeast, extending southwards through the Lowveld to Eswatini and the eastern lowlands of KwaZulu-Natal province (Branch 1998; Broadley 2000). *EOO*: 331 000 km^2; *Distribution*: 163 000 km^2.

Countries of occurrence: Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Somalia, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Rupicolous and arboreal, occurring in Woodland from coastal plains and mangroves to low mountain slopes along the eastern escarpment of South Africa, up to 1 000 m a.s.l. elevation (Jacobsen 1989; Broadley 2000; Bourquin 2004). It is commensal with humans in many regions. *Habitat*: Savanna.



Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with portions of the range that are not significantly impacted by habitat transformation, and it is tolerant of some habitat transformation.

Conservation and research recommendations: The taxonomy of the broader *T. striata* group, which includes *T. punctatissima* and *T. sparsa*, requires further investigation, including the issue of misidentifications between *T. striata* and *T. punctatissima*.

Trachylepis striata, Mount Namuli, Mozambique (© W. Conradie).

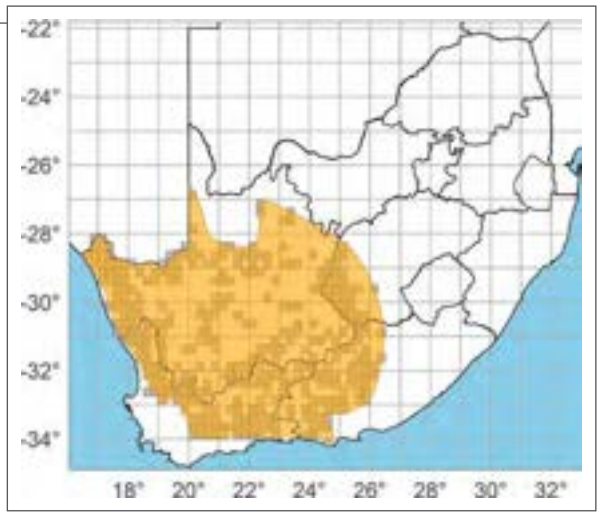
Family **Scincidae**

Trachylepis sulcata (Peters, 1867)

Western Rock Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Trachylepis sulcata sulcata* – Least Concern (SARCA).

Assessment rationale: This species is widespread and common. It is not under any major threats, and it is well protected.

Taxonomic notes: Three poorly defined subspecies of *T. sulcata* have been recognised, *T. s. sulcata*, *T. s. ansorgii* and *T. s. nigra* (Bauer et al. 1993; Branch 1998). In a recent phylogenetic study, *T. s. nigra* from Namibia was not found to be genetically distinct from the nominate subspecies (Portik et al. 2010, 2011). *Trachylepis s. ansorgii* occurs in Angola, not in northern Namibia (Butler 2020) as had been suggested (Branch 1998; Bauer et al. 1993), and its taxonomic status requires further investigation. *Other important*

Trachylepis sulcata, male colouration, Oviston Nature Reserve, Eastern Cape province (© W. Conradie).

Trachylepis sulcata sulcata, female colouration, Murraysburg, Western Cape province © L. Kemp).

Trachylepis sulcata sulcata, male colouration, near Grünau, Namibia (© L. Verburgt).

names: *Mabuya sulcata sulcata*; *Mabuya sulcata nigra*; *Mabuya sulcata ansorgii*.

Distribution: Widespread in Namibia, Angola and the western and central parts of South Africa (Broadley 2000). Within South Africa it occurs throughout the central, southern and western parts of the country, although there is a distribution gap in the extreme southwestern Cape region. *EOO*: 582 000 km^2; *Distribution*: 490 000 km^2.

Countries of occurrence: Angola**,** Namibia, South Africa.

Habitat and ecology: A rupicolous skink that can be abundant on rock outcrops in Arid Savanna, Karroid Veld and Desert (Branch 1998; Broadley 2000). *Habitat*: Desert, Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: This widespread and abundant species is regarded as stable.

Conservation and research recommendations: The taxonomic status and distribution of *T. s. ansorgii* requires investigation.

Family **Scincidae**

Trachylepis varia (Peters, 1867)

Eastern Variable Skink

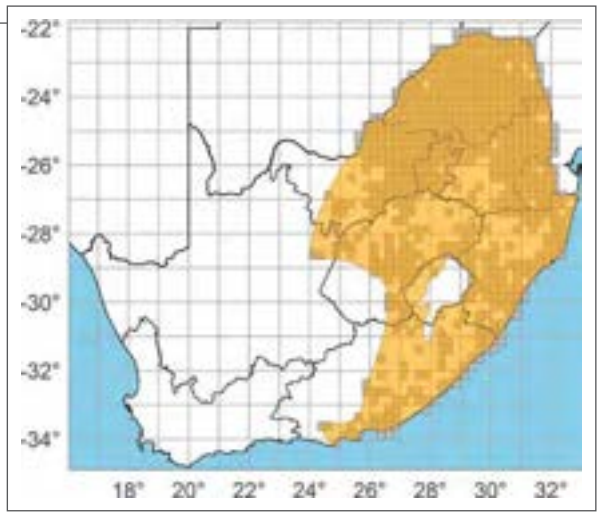
LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant with no significant threats.

Taxonomic notes: The *T. varia* complex consists of multiple cryptic species (Weinell & Bauer 2018). Within the complex, *T. laevigata* and *T. damarana* have recently been reinstated (Weinell & Bauer 2018) and all three species appear to be sympatric in parts of their ranges in the northern parts of South Africa. However, the majority of '*T. varia*' museum specimens have not been reassigned to the newly defined cryptic species, and genetic analysis of samples has confirmed sympatry (Stephens et al. 2022). The status of the remaining candidate species from central Africa, East Africa and the Horn of Africa remains unresolved. *Other important names*: *Mabuya varia*.



Distribution: Widespread across southern and East Africa, extending north into the Horn of Africa and possibly also occurring in southeastern Botswana (Weinell & Bauer 2018). Regionally, the species has an extensive distribution across the eastern half of South Africa and Eswatini (Weinell & Bauer 2018). It does not occur at high elevations in Lesotho and adjacent South Africa. It is currently not known how widespread the species is in the northwestern and northeastern parts of South Africa, as the

Trachylepis varia, Dinokeng Game Reserve, Gauteng province (© G. Alexander).

Trachylepis varia, Fort Fordyce Nature Reserve, Eastern Cape province (© W. Conradie).

majority of museum voucher specimens have not yet been assigned to the newly defined species. *EOO*: 775 000 km^2; *Distribution*: 627 000 km^2.

Countries of occurrence: Burundi, Democratic Republic of the Congo, Eswatini, Ethiopia, Eritrea, Kenya, Lesotho, Malawi, Mozambique, Rwanda, Somalia, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Abundant in open, rocky areas in several habitat types from sea level to 1 900 m a.s.l. (Jacobsen 1989; Branch 1998; Broadley 2000; Bourquin 2004). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because it is widespread and abundant, occurring in areas that are not impacted by habitat transformation.

Conservation and research recommendations: All *T. varia sensu lato* museum specimens should be re-examined to assess the degree of the distribution overlap between this species and the recently reinstated *T. damarana* and *T. laevigata*. In addition, the taxonomic status of the remaining candidate species from East Africa requires assessment.

Family **Scincidae**

Trachylepis variegata (Peters, 1870)

Variegated Skink

LC – Least Concern (Regional)

Assessors: Conradie, W., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread and common, occurring primarily in areas that are not under substantial habitat transformation.

Taxonomic notes: No taxonomic issues. *Other important names*: *Mabuya variegata*.

Distribution: Occurs across the central and western regions of southern Africa, extending into southern Angola (Branch 1998; Broadley 2000; Portik & Bauer 2012). In South Africa, it is widespread across the west-central areas, although there is a distribution gap along the southwestern coastal region. *EOO*: 633 000 km²; *Distribution*: 513 000 km².

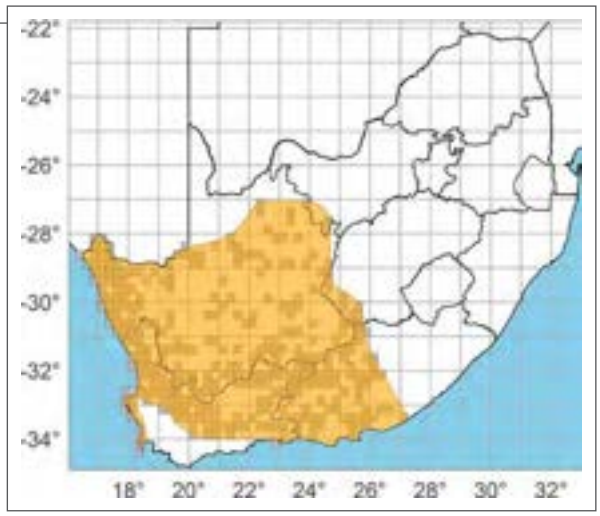
Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: A terrestrial species occurring in the arid regions of southern Africa, mainly in rocky areas but also in sandy, gravel habitat (Broadley 2000). *Habitat*: Desert, Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.



Trachylepis variegata, Murraysburg, Western Cape province (© L. Kemp).

Trachylepis variegata, Springbok, Northern Cape province (© L. Kemp).

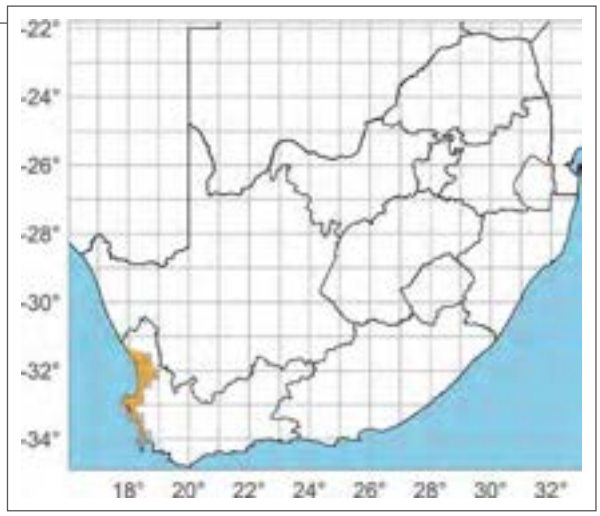
Typhlosaurus caecus (Cuvier, 1816)

Southern Blind Legless Skink

South African endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common throughout its range, with no significant threats.

Taxonomic notes: There is a potential taxonomic issue relating to the three *Typhlosaurus* species from the west coast of South Africa (*T. caecus*, *T. lomiae*, *T. vermis*) because they are morphologically similar, there is shallow genetic divergence between them (Lamb et al. 2010), and their ranges are nearly continuous. *Other important names*: none.

Distribution: Occurs along the west coast in the Western Cape province of South Africa (Bates et al. 1998). The southern limit of the distribution around Cape Town is represented by just a few isolated records (most recent record from 2019) and this suggests that small remnant populations persist within the urban environment. *EOO*: 119 100 km^2; *Distribution*: 8 380 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, found in partly vegetated, sandy soils in coastal and sandveld habitats from sea level to at least 100 m a.s.l. elevation. *Habitat*: Shrubland, Coastal sand dunes.

Threats: Urbanisation in the Cape Town metropolitan area has essentially reduced the suitable habitat in the south, with possibly relict populations persisting, which might not be viable in the long term.

Population trend: Overall, the species is considered stable at present, but might have declined in the past in the southern portion of the range.

Conservation and research recommendations: Surveys for the distributional extent of relict populations in Cape Town are needed, as are estimates of densities. Because Lamb et al. (2010) included only one specimen per species, a follow-up phylogenetic assessment of the three west coast species with increased geographic sampling is needed to fully resolve the taxonomy.

Typhlosaurus caecus, Lambert's Bay, Western Cape province (© L. Kemp).

Family **Scincidae**

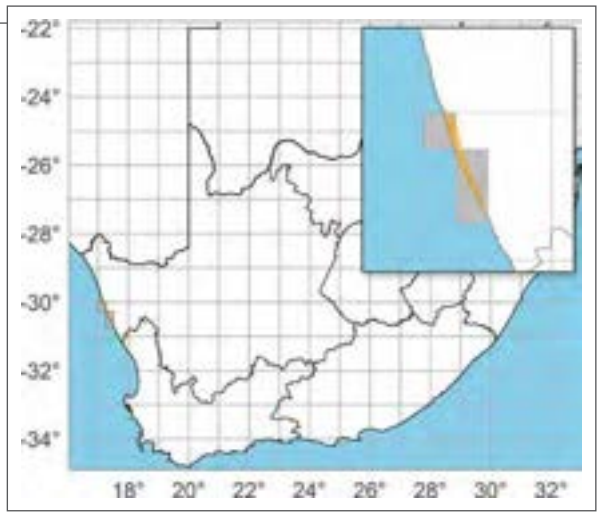
Typhlosaurus lomiae Haacke, 1986

Lomi's Blind Legless Skink

South African endemic

NT – Near Threatened, B1b(iii) (Global)

Assessors: Conradie, W., Bauer, A.M., Weeber, J., Pietersen, D.W., Tolley, K.A., Alexander, G.J.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Vulnerable (Global IUCN assessment) as *Typhlosaurus lomii*.
1994: Rare (Global IUCN assessment) as *Typhlosaurus lomii*.

Reason for recent change: Genuine (2018 to 2022).

Reason for previous change: Non-genuine (2014/2017 to 2018).

Assessment rationale: Although this species has a very small distribution, it can be locally abundant. Nevertheless, about 20% of the range has been heavily fragmented due to mining since at least 1990. While the population size is suspected to be stable, there is the potential for new mining operations that would overlap substantially with the range. Because the EOO is small, there is very little buffer to protect this species from declines and the change in land use could rapidly increase the extinction risk. Assessed as Near Threatened in 2017, this assessment was erroneous given the lack of threats at the time, and it was therefore downlisted to Least Concern in

Typhlosaurus lomiae, Koringkorrelbaai campsite, Namaqua National Park, Northern Cape province (© R. van Huyssteen).

2018. However, there is now a new threat of mining, necessitating the uplisting of the species to Near Threatened.

Taxonomic notes: There is a potential taxonomic issue relating to the three *Typhlosaurus* species from the west coast of South Africa (*T. caecus*, *T. lomiae*, *T. vermis*), because they are morphologically similar, there is shallow genetic divergence between them (Lamb et al. 2010), and their ranges are nearly continuous. *Other important names*: none.

Distribution: Endemic to Namaqualand District in the West Coast region of the Northern Cape province, South Africa. *EOO*: 504 km^2; *Distribution*: 356 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, found in low, vegetated sand dunes, often in association with termitaria (Haacke 1986; Bauer et al. 2000), at elevations of less than 100 m a.s.l. *Habitat*: Desert, Shrubland.

Threats: Most of the distribution is not impacted by habitat loss, although the southern portion of the range is becoming more urbanised, and mining has already destroyed nearly 20% of the range and this poses a threat. The South African Department of Mineral Resources issued an Integrated Environmental Authorisation (June 2019) to expand the area of coastal strip mining and logistical operations, and this was approved in March 2020 by the South African Department of Forestry, Fisheries and the Environment (https://www.mineralcommodities.com/wp-content/uploads/2020/03/Tormin-Environmental-Approval.pdf). Given the narrow distribution of this species in coastal sands, increased mining is very likely to have a negative impact.

Population trend: This skink can be locally abundant (Bauer et al. 2000) and currently, most of its range is not impacted by human activities. While the population size is suspected to be stable, the expected changes to land use in the area could rapidly increase the extinction risk.

Conservation and research recommendations: Improved information on the range of this species would assist in assessing whether mining and related development might impact the species. Research on the extent of emerging pressures is required to assess population trends, i.e., the expanding mining footprint should be monitored to assess further declines in habitat quality and extent. Because Lamb et al. (2010) included only one specimen per species, a follow-up phylogenetic assessment of the three west coast species with increased geographic sampling is needed to fully resolve the taxonomy.

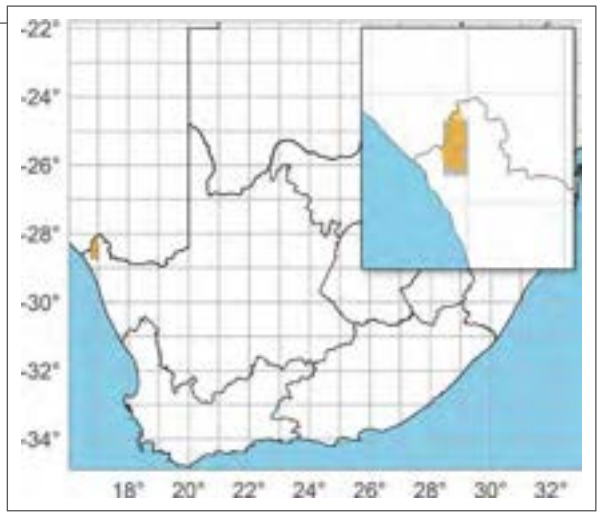
Family **Scincidae**

Typhlosaurus meyeri Boettger, 1894

Meyer's Blind Legless Skink

LC – Least Concern (Regional)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Occurs primarily in areas that have not undergone substantial habitat transformation. Although parts of the range are intensively mined for diamonds in Namibia, most of the distribution falls within the Sperrgebiet buffer zones that are protected from public access and are not mined. Within South Africa, the distribution is small, but there is no evidence of declines.

Taxonomic notes: There is a potential taxonomic issue relating to the three *Typhlosaurus* species from the west coast of South Africa (*T. caecus*, *T. lomiae*, *T. vermis*), because they are morphologically similar, there is shallow genetic divergence between them (Lamb et al. 2010), and their ranges are nearly continuous. *Other important names*: none.

Distribution: Occurs in the Lüderitz district of southern Namibia and marginally into the adjacent northwestern Richtersveld of the Northern Cape province, South Africa (Broadley 1968; Haacke 1986; Bauer & Branch 2003 [2001]). *EOO*: 1 330 km^2; *Distribution*: 1 070 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in sparsely vegetated dunes and other areas of loose sand in the southern Namib and into adjacent South Africa (Bauer & Branch 2003 [2001]), mainly below 500 m a.s.l. elevation. *Habitat*: Desert.

Threats: There are no substantial threats to this species.

Population trend: Because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: No recommendations.

Typhlosaurus meyeri, Sperrgebiet, Namibia (© J. Marais).

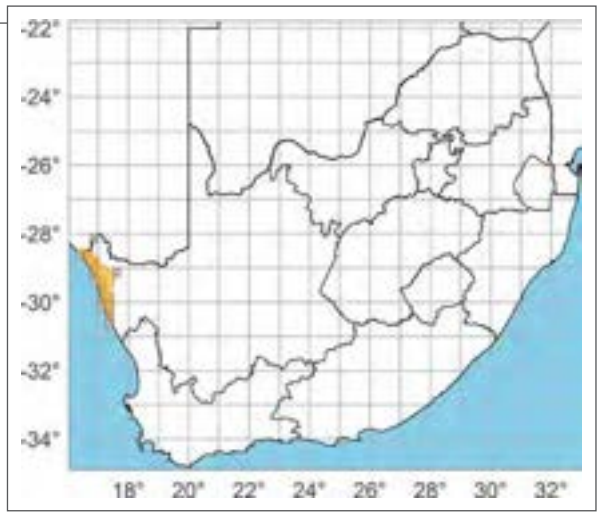
Typhlosaurus vermis Boulenger, 1887

Pink Blind Legless Skink

South African near-endemic

LC – Least Concern (Global)

Assessors: Bauer, A.M., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a moderate-sized range and is common throughout, with no major threats.

Taxonomic notes: There is a potential taxonomic issue relating to the three *Typhlosaurus* species from the west coast of South Africa (*T. caecus*, *T. lomiae*, *T. vermis*), because they are morphologically similar, there is shallow genetic divergence between them (Lamb et al. 2010), and their ranges are nearly continuous. *Other important names*: none.

Distribution: Occurs along the northwestern coastal regions of South Africa, extending into southern Namibia. The Namibian portion of the distribution is known from a single record. Several historical records that showed the species to be more widespread to the east and south have been discounted (Bauer & Conradie 2018b). *EOO*: 17 750 km^2; *Distribution*: 10 100 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Fossorial, found in sparsely vegetated sandy soils in coastal and sandveld habitats, from sea level to at least 900 m a.s.l. elevation. *Habitat*: Coastal sand dunes, Desert, Shrubland.

Threats: No major threats.

Population trend: The population size is not thought to have declined significantly because this lizard occurs mainly in arid regions that have not been significantly impacted by habitat transformation.

Conservation and research recommendations: Because Lamb et al. (2010) included only one specimen per species, a follow-up phylogenetic assessment of the three west coast species with increased geographic sampling is needed to fully resolve the taxonomy. Additional records from Namibia are needed to better estimate the distribution in the north of the range.

Typhlosaurus vermis, Koingnaas, Northern Cape province (© L. Kemp).

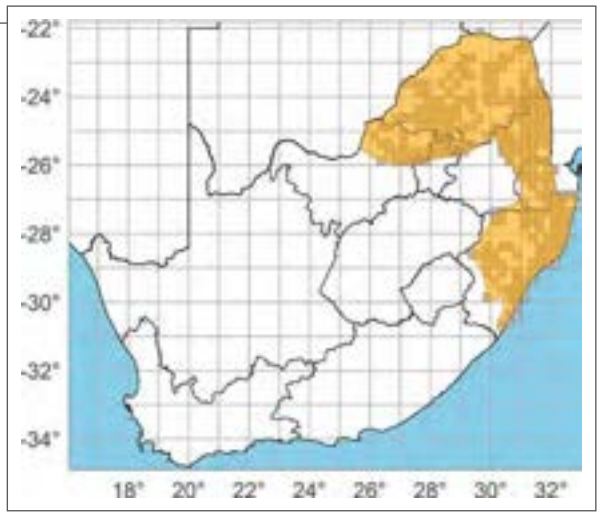
Family **Agamidae**

Acanthocercus atricollis (Smith, 1849)

Southern Tree Agama

LC – Least Concern (Regional)

Assessors: Bates, M.F., De Villiers, A., Conradie, W.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA) as *Acanthocercus atricollis atricollis*.
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and very common in certain parts of its range, especially in bushveld areas, with no significant threats.

Taxonomic notes: Six subspecies were recognised by Klausewitz (1957), although these largely lacked distinguishing morphological traits and thus were often disregarded by subsequent authors (e.g., Broadley & Howell 1991). However, many of these subspecies were subsequently shown to be genetically distinct and have been elevated to full species, although there are still some outstanding issues such as the status of the isolated populations in the Democratic Republic of the Congo (Wagner et al. 2018). *Other important names*: none.

Distribution: This species has an extensive distribution in southern Africa. Based on the most recent revision of this species complex (Wagner et al. 2018), the distribution of *A. atricollis* extends from

Acanthocercus atricollis, Lower Sabie, Kruger National Park, Limpopo province (© W.R. Schmidt).

northeastern South Africa northwards through southern Africa as far as southern Malawi. Regionally, it has a relatively wide distribution from northern Limpopo province extending south as far as KwaZulu-Natal province and west as far as North West province. *EOO*: 424 000 km^2; *Distribution*: 281 000 km^2.

Countries of occurrence: Botswana, Eswatini, Malawi, Mozambique, South Africa, Zimbabwe, Democratic Republic of the Congo (presence uncertain).

Habitat and ecology: Mainly arboreal, although individuals will traverse open ground when moving between trees and often forage at or around the tree base. They take refuge and sleep under loose bark, in hollow branches, or in holes or crevices in tree trunks (Branch 1998; Jacobsen 2005). *Habitat*: Forest, Grassland, Savanna.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with large parts of the distribution not impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the isolated populations in the Democratic Republic of the Congo needs to be resolved.

Acanthocercus atricollis, male colouration, Modimolle, Limpopo province (© R.I. Stander).

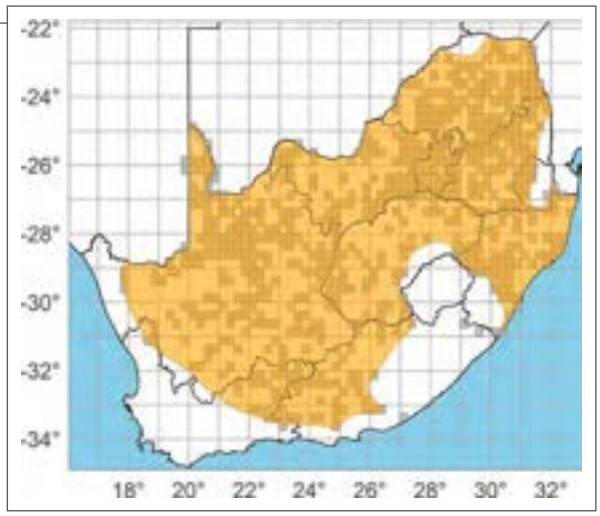
Family **Agamidae**

Agama aculeata Merrem, 1820

Common Ground Agama

LC – Least Concern (Regional)

Assessors: Bates, M.F., De Villiers, A., Conradie, W.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Agama aculeata aculeata* – Least Concern (SARCA).
2014: *Agama aculeata distanti* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Agama aculeata aculeata* Merrem, 1820.
- *Agama aculeata distanti* Boulenger, 1902.

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: Previous species delimitation of *Agama* was based on morphological and geographic variation (McLachlan 1981), but recent multilocus phylogenetic work has revealed the phylogenetic relationships of African *Agama*, including those among the southern African taxa (Leaché et al. 2009, 2014). However, the taxonomic status of the *Agama aculeata* species complex (*A. aculeata aculeata, A. a. distanti* and *A. armata*) requires further investigation because no samples of *A. a. distanti* were included in those studies. Although McLachlan (1981) referred ground agamas from KwaZulu-Natal province to *A. armata*, these are currently considered to be *A. a. distanti* (Jacobsen 1992b; Bourquin 2004). Previous records of individuals from southern Zambia and throughout Zimbabwe are based on the throat colour pattern,

Agama aculeata aculeata, 30 km southwest of Prieska, Northern Cape province (© M. Burger).

Agama aculeata aculeata, male (left) and female (right) colouration, Olifantshoek, Northern Cape province (© L. Kemp).

Agama aculeata distanti, Matoks, Limpopo province (© R.I. Stander).

but the taxonomic validity of this character is questionable (Jacobsen 1992b) and these records are currently assigned to *A. armata* (e.g., Branch 1998). *Other important names*: none.

Distribution: Occurs in southern Africa where it has an extensive range in Angola, most of Namibia (except the Namib Desert), most of Botswana (where it is likely replaced in the eastern parts by *A. armata*, although accurate distributional data are lacking) and South Africa (McLachlan 1981; Visser 1984f; Jacobsen 1992b). Scattered records in southern KwaZulu-Natal province and the Eastern Cape province require confirmation. There is an area of sympatry between this species and *A. hispida* in the Northern and Western Cape provinces. The species possibly occurs in Zambia and Zimbabwe (Jacobsen 1992b). *EOO*: 1 336 000 km^2; *Distribution*: 962 000 km^2.

Countries of occurrence: Angola, Botswana, Eswatini, Mozambique, Namibia, South Africa.

Habitat and ecology: A largely terrestrial species, common in dry sandy areas where it takes refuge under thorny bushes such as buffalo thorn (*Ziziphus mucronata*; De Waal 1978). It occasionally basks in the branches of bushes or trees and retreats into small mammal burrows or short, self-excavated holes at the bases of bushes or under stones (Visser 1984f; Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs over large areas that are not impacted by habitat transformation.

Conservation and research recommendations: Inclusion of samples of *A. a. distanti* in phylogenetic studies is needed so that its taxonomic status can be assessed, particularly with reference to *A. armata*. The geographic boundaries between this species and *A. armata* should also be established, ideally using genetically verified sequences. Records in northern Namaqualand in the Northern Cape province, South Africa need to be investigated as some of these may be referable to *A. hispida*.

Family **Agamidae**

Agama anchietae Bocage, 1896

Anchieta's Agama

LC – Least Concern (Regional)

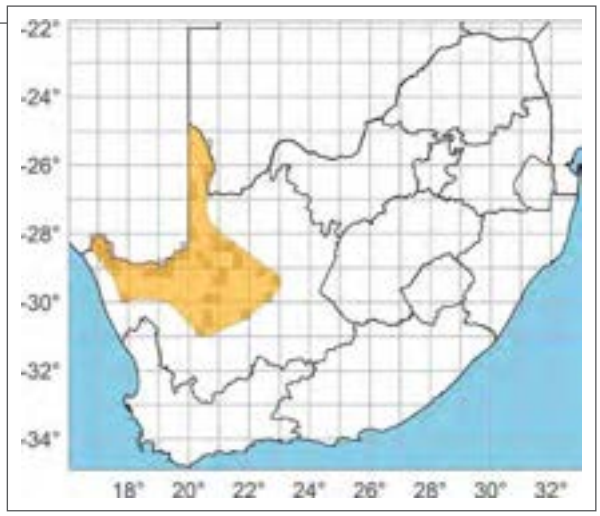
Assessors: De Villiers, A., Bates, M.F., Conradie, W.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a relatively large distribution in remote areas with no significant threats.

Taxonomic notes: Several comprehensive molecular phylogenetic studies have firmly established that *A. anchietae* is a distinct species, most closely related to *A. atra* (Matthee & Flemming 2002; Swart et al. 2009; Leaché et al. 2009, 2014). In addition, three well-structured distinct populations have been identified, but further analysis is required before any taxonomic adjustments within *A. anchietae* are made (Nielsen 2016). *Other important names*: none.

Distribution: Has a very large distribution that extends from the northwestern part of South Africa northwards through Namibia and Angola to the southern Democratic Republic of the Congo (McLachlan 1981; Visser 1984f; Branch 1998). In South Africa, it occurs only in the Northern Cape province (Nielsen 2016). *EOO*: 244 000 km²; *Distribution*: 128 000 km².



Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Namibia, South Africa.

Habitat and ecology: Both terrestrial and rupicolous, but generally not on larger rock outcrops, particularly where sympatric with *A. atra*. Generally occurs in flat, dry, sparsely vegetated areas, which are typically associated with bedrock, small rock piles and broken ground, and occasionally found in the lower branches of trees (Branch 1998; Bauer & Branch 2003 [2001]). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs mainly in areas that are not notably impacted by habitat transformation.

Conservation and research recommendations: The genetic structure within *A. anchietae* should be assessed in a taxonomic framework.

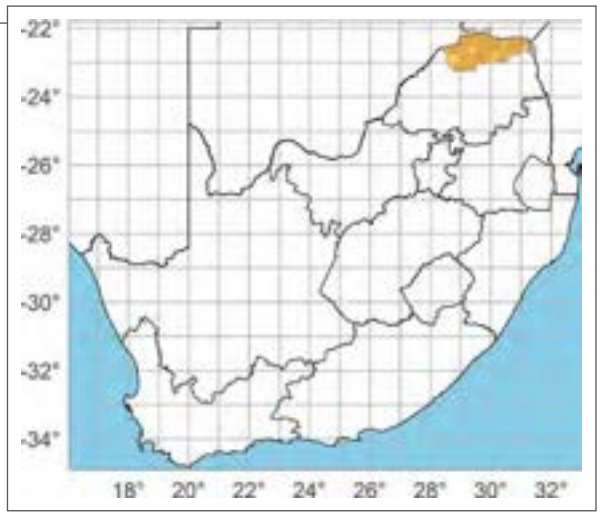
Agama anchietae, south of Grootdrink, Northern Cape province (© M. Burger).

Agama armata Peters, 1855

Peters' Ground Agama

LC – Least Concern (Regional)

Assessors: Bates, M.F., De Villiers, A., Conradie, W.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and relatively common with no significant threats.

Taxonomic notes: A phylogenetic analysis of the African Agamidae shows low divergence between *A. armata* and *A. aculeata* (Leaché et al. 2014), and the relationship between these two species merits further evaluation. *Other important names*: none.

Distribution: Widespread from East Africa (Spawls et al. 2018) into southern Africa extending into eastern Botswana and the eastern Caprivi region of Namibia (FitzSimons 1943; McLachlan 1981; Branch 1998). In South Africa it occurs in the northern half of Limpopo province (Jacobsen 1992b). *EOO*: 24 900 km^2; *Distribution*: 22 100 km^2.

Countries of occurrence: Botswana, Kenya, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: A terrestrial species associated with areas of deep sand, calcrete flats and open Woodland (Jacobsen 1989; Branch 1998, 2005). Often shelters under flat, partially buried rocks (Jacobsen 1989) and uses a short burrow dug into sandy soil at the base of a bush, or a rodent tunnel, for temporary

Agama armata, Greater Kuduland Safaris, Limpopo province (© M. Burger).

Family **Agamidae**

Agama armata, Banhine National Park, Mozambique (© E.W. Pietersen).

shelter (Branch 1998, 2005). In South Africa it occurs at elevations of 400–800 m a.s.l. (Jacobsen 1989). *Habitat*: Savanna.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs mainly in areas that are not notably impacted by habitat transformation.

Threats: There are no substantial threats to this species.

Conservation and research recommendations: The low genetic divergence between *A. armata* and *A. aculeata* should be investigated in a taxonomic framework.

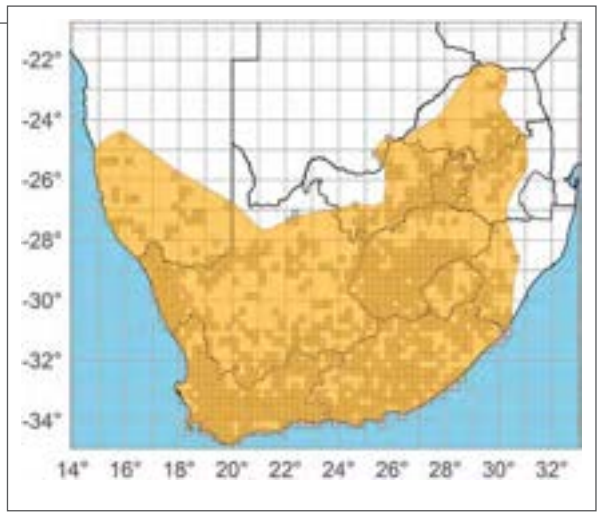
Agama atra Daudin, 1802

Southern Rock Agama

Regional near-endemic

LC – Least Concern (Global)

Assessors: De Villiers, A., Bates, M.F., Conradie, W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and locally abundant with no substantial threats.

Taxonomic notes: Although not formally elevated, *A. atra knobeli* from Namibia has been treated as a full species (Matthee & Flemming 2002; Swart et al. 2009). Subsequent phylogenetic studies show that *A. knobeli* is not valid (Nielsen 2016), and it therefore must be treated as a junior synonym of *A. atra*. *Agama atra* can be confused with *A. anchietae*, possibly resulting in incorrect distribution mapping in some areas of the Northern Cape province where they presumably co-occur. *Other important names*: *Agama atra knobeli*; *Agama knobeli*.

Distribution: Occurs throughout most of South Africa, extending into southern Namibia, Lesotho and marginally into southern Botswana. There are gaps in the distribution in northeast KwaZulu-Natal province and the Kalahari region. Records from Eswatini are

Agama atra, female colouration, Bladgrond, Northern Cape province (© C.R. Hundermark).

Agama atra, male colouration, Strydpoort, Limpopo province (© R.I. Stander).

Agama atra, Springbok, Northern Cape province (© L. Kemp).

Family **Agamidae**

Agama atra, male colouration, Witsand Nature Reserve, Northern Cape province (© L. Kemp).

considered doubtful (Boycott 1992a) and are therefore not included as part of the distribution. *EOO*: 1 677 000 km^2; *Distribution*: 1 221 000 km^2.

Countries of occurrence: Botswana, Lesotho, Namibia, South Africa.

Habitat and ecology: A rupicolous species that occurs in a variety of rocky habitats, ranging from sea level to mountains reaching 2 200 m a.s.l. (De Waal 1978; Jacobsen 1989). Shelters in rock crevices and under rocks. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no major threats to this widespread species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs mainly in areas that are not notably impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

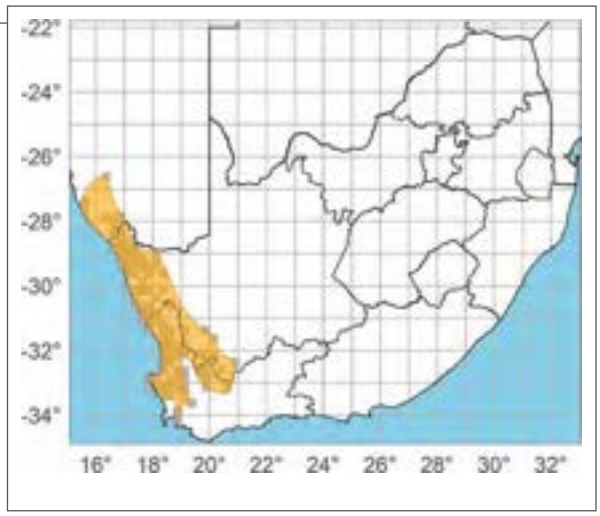
Agama hispida (Kaup, 1827)

Spiny Ground Agama

Regional near-endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Bates, M.F., De Villiers, A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2011: Least Concern (Global IUCN assessment).

Assessment rationale: This species is widespread, fairly common and has no major threats. The EOO has declined due to habitat transformation resulting in the loss of the southernmost subpopulation at the range edge in what is now the Cape Town metropolitan area.

Taxonomic notes: The apparently disjunct population in the northwest Free State province, South Africa (De Waal 1978) probably refers to *A. aculeata distanti* and records to the east of the distribution probably refer to *A. aculeata aculeata*. *Other important names*: none.

Distribution: Distributed in the western arid areas of South Africa, from the south coastal region northwards into southwestern Namibia (McLachlan 1981), extending along the western Great Escarpment and

Agama hispida, southern Namibia (© G. Alexander).

Family **Agamidae**

Agama hispida, Groenriviermond, Roode Heuvel, Northern Cape province (© W. Conradie).

marginally into the Karoo. Although originally occurring southward to the lower elevation areas in the Cape Town area (McLachlan 1981), there are no recent records from there and this subpopulation appears to have become locally extinct. *EOO*: 177 300 km^2; *Distribution*: 112 800 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs on flat, sparsely vegetated areas primarily in the Fynbos and Succulent Karoo biomes, extending marginally into the Nama-Karoo biome. Seeks refuge in holes and short tunnels under grasses and at the base of bushes (FitzSimons 1943; Visser 1984f). *Habitat*: Shrubland.

Threats: There are no major threats to this widespread species, although the species appears to have become locally extinct in the highly urbanised parts of the range around Cape Town.

Population trend: There is some habitat loss across the range, and the EOO appears to have decreased in the southwest of the range. Despite this, the species is widespread and abundant elsewhere and this presumably mitigates against the negative effects of the local population decline in the southwestern extent of the range.

Conservation and research recommendations: No recommendations.

Family **Chamaeleonidae**

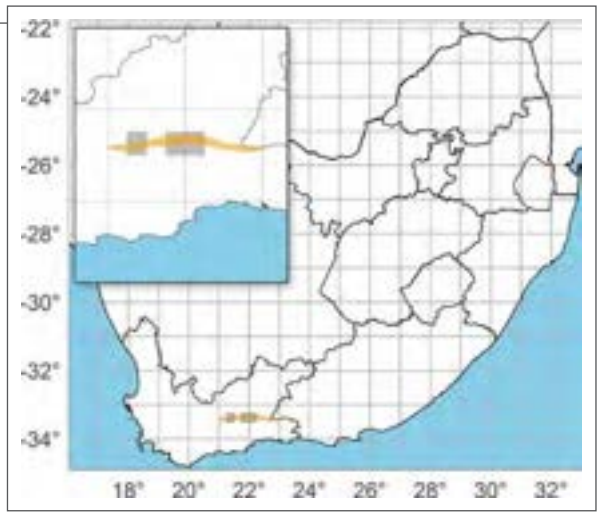
Bradypodion atromontanum Branch, Tolley & Tilbury, 2006

Swartberg Dwarf Chameleon

South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although the distribution is small, this chameleon occurs entirely within a protected area, and is unlikely to experience habitat loss or population declines. A large wildfire could have an impact on population numbers; however, this species naturally occurs in a fire-prone system and the population should rebound.

Taxonomic notes: Although there are no notable taxonomic issues (Branch et al. 2006), this species can be confused with *B. gutturale* (Tolley & Burger 2007). *Other important names*: none.

Distribution: Endemic to the Klein Swartberg and Groot Swartberg, Western Cape province, South Africa (Tolley & Burger 2007). *EOO*: 2 650 km^2; *Distribution*: 1 510 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in Fynbos vegetation at elevations of 700–1 800 m a.s.l. (Branch et al. 2006). *Habitat*: Shrubland.

Threats: There are no significant threats to this species, as it is distributed entirely within a protected area. *Use and trade*: There is no known trade in this species at present (UNEP-WCMC 2020).

Population trend: In spite of the small geographic range of this chameleon, it occurs in an area where there has been no habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Bradypodion atromontanum, Swartberg, Western Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

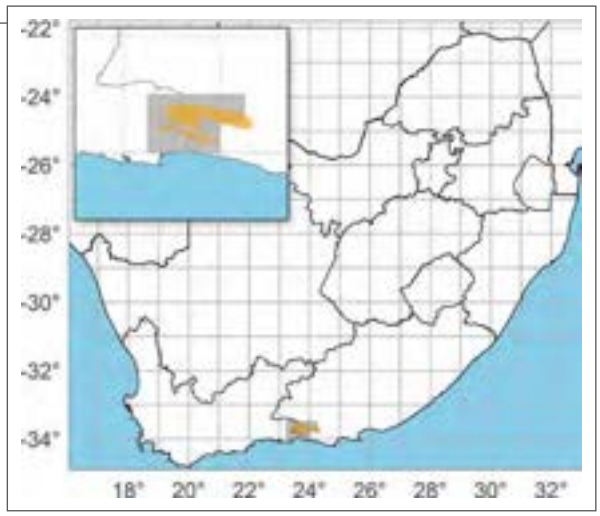
Bradypodion barbatulum Tolley, Tilbury & Burger 2022

Beardless Dwarf Chameleon

South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
Not previously assessed.

Assessment rationale: Has a large distribution, occurring across three mountain chains in South Africa. Some of the lower slopes of these mountains are heavily impacted by agriculture, and the Fynbos habitat is becoming overrun by the invasive silky hakea (*Hakea sericea*) in some areas. However, this chameleon is widespread and most of the range is within very remote mountainous areas. Approximately half of the distribution falls within a large, protected area managed by Eastern Cape Parks and Tourism Agency. Although a large portion of the distribution is on private lands, which might not be secure into the future, the private lands are remote and not heavily transformed.

Taxonomic notes: There was long-standing taxonomic uncertainty regarding this population given its morphological similarity to a population in the nearby Baviaanskloof Mountains. Both populations have been recently described as separate species (Tolley et al. 2022). *Other important names*: none.

Distribution: This chameleon occurs on the northern slopes of the Tsitsikamma Mountains, on the Langkloof Mountains and throughout the Kouga range of mountains, South Africa (Tolley et al. 2022). This species might be excluded from, or occur at low abundance on, the more arid, lower elevations of the Kouga Mountains, but is plentiful at the mesic, higher elevations above 900 m a.s.l. On the comparatively mesic northern slopes of the Tsitsikamma Mountains

Bradypodion barbatulum, Kouga Mountains, Eastern Cape province (© K.A. Tolley).

Bradypodion barbatulum, Kouga Mountains, Eastern Cape province (© K.A. Tolley).

Bradypodion barbatulum, Kouga Mountains, Eastern Cape province (© K.A. Tolley).

it occurs at all elevations. Approximately half of the distribution falls within the Baviaanskloof World Heritage Site. *EOO*: 2 340 km^2; *Distribution*: 1 400 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Appears to use all types of Fynbos vegetation as perching sites (e.g., restios, sedges, proteas, ericas, grasses). It has been observed to traverse the ground during the day, moving between bushes. *Habitat*: Fynbos.

Threats: Although some of the habitat is impacted by agriculture, this affects a minor proportion of the overall range. It appears that the invasion of silky hakea (*Hakea sericea*) on the lower slopes of the Tsitsikamma Mountains is becoming progressively worse, and this is seriously impacting the quality of the Fynbos habitat in a minor part of the range. *Use and trade*: There is no known trade in this species (UNEP-WCMC 2020).

Population trend: Given this is a widespread species and most of the population occurs in an area that is not impacted by habitat loss, the population is suspected to be stable.

Conservation and research recommendations: The removal of the invasive silky hakea (*Hakea sericea*) around the lower slopes of the Tsitsikamma Mountains would improve the habitat quality.

Family **Chamaeleonidae**

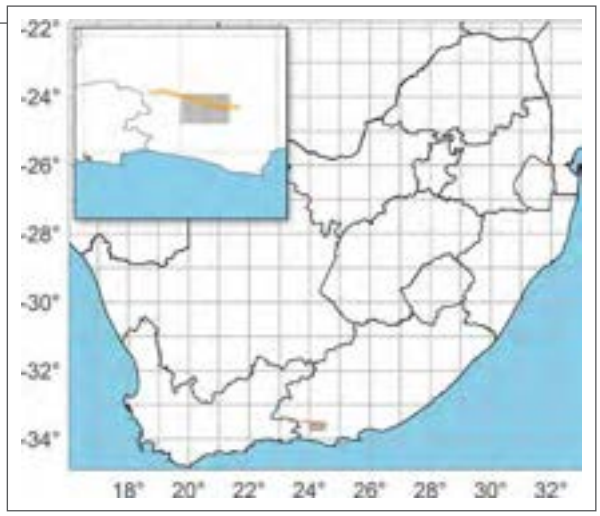
Bradypodion baviaanense Tolley, Tilbury & Burger 2022

Baviaanskloof Dwarf Chameleon

South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
Not previously assessed.

Assessment rationale: This species is widespread across a very remote mountain chain that is not impacted by habitat loss or other human activities. The known distribution falls within the Baviaanskloof World Heritage Site, which is managed by the Eastern Cape Parks and Tourism Agency. There has been some historical (and ongoing) agriculture and cattle grazing on the lower slopes, but many of these farms are being incorporated into the Baviaanskloof World Heritage Site. In addition, the chameleon only occurs at higher elevations (probably above 900 m a.s.l.) where the habitat has not been notably impacted.

Taxonomic notes: There was long-standing taxonomic uncertainty regarding this population given its morphological similarity to the population in the nearby Kouga Mountains. Both populations have been recently described as separate species (Tolley et al. 2022). *Other important names*: none.

Distribution: Occurs at the higher elevations in the Baviaanskloof Mountains, South Africa (Tolley et al. 2022). The distribution falls entirely within the Baviaanskloof World Heritage Site. *EOO*: 570 km^2; *Distribution*: 340 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs at higher elevations of the Baviaanskloof Mountains in the Fynbos biome. It is not known to occur at lower elevations or in the valley that separates these mountains from the Kouga Mountains that are to the south. It appears to be plentiful at mesic elevations above

Bradypodion baviaanense, Baviaanskloof Mountains, Eastern Cape province (© K.A. Tolley).

Bradypodion baviaanense, Baviaanskloof Mountains, Eastern Cape province (© K.A. Tolley).

Bradypodion baviaanense, Baviaanskloof Mountains, Eastern Cape province (© K.A. Tolley).

900 m a.s.l., where it perches on Fynbos vegetation (e.g., restios, sedges, proteas, ericas, grasses). *Habitat*: Fynbos.

Threats: No known significant threats. *Use and trade*: There is no known trade in this species (UNEP-WCMC 2020).

Population trend: Given the population occurs in an area that does not appear to be impacted by habitat loss or other notable ecological changes, the population is suspected to be stable.

Conservation and research recommendations: No recommendations.

Family **Chamaeleonidae**

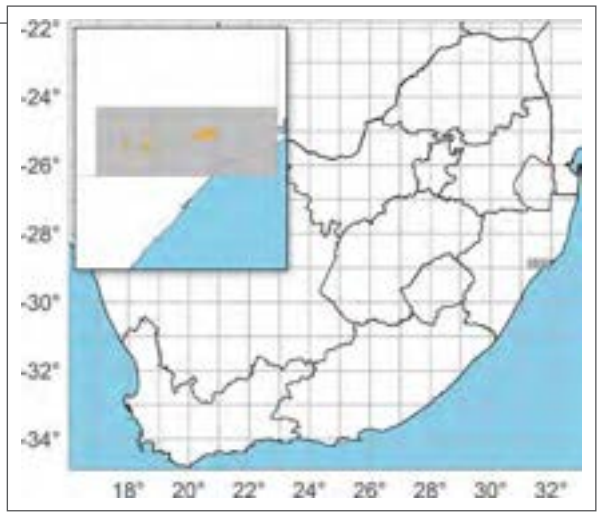
Bradypodion caeruleogula Raw & Brothers, 2008

Eshowe Dwarf Chameleon

South African endemic

EN – Endangered B1ab(i,ii,iii,v)+2ab(i,ii,iii,v) (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Endangered (Global IUCN assessment).
2017: Endangered (Global IUCN assessment).
2014: Endangered (SARCA).

Assessment rationale: This species has a very small distribution (50 km^2) and occurs in only three forests (Ntumeni, Dlinza and Ngoya), which can be considered as isolated subpopulations. Ntumeni Forest (in a rural area) is fragmented due to human activities, whereas Ngoya (in a rural area) and Dlinza (in the town of Eshowe) are not as heavily transformed but nevertheless impacted and vulnerable to external pressures. The EOO and AOO are small and have declined primarily due to forest loss at Ntumeni. All individuals occur in small, isolated subpopulations that lack connectivity. At least one of these subpopulations (Ntumeni) has declined due to habitat loss and it is uncertain whether these subpopulations are viable into the future. The population is also considered to be in three locations, each of which could be rapidly affected by the threat of habitat loss. There is ongoing forest degradation and the disruption of landscape-level processes due to the presence of high human populations adjacent to the forests, both within buffer zones and across the broader landscape (Berliner et al. 2006). Human population densities are especially high near Dlinza and Ngoya (D. Berliner, pers. comm. 2014). Ngoya is formally protected but is nevertheless negatively affected by human activities (Boudreau et al. 2005). Dlinza and Ntumeni are also protected, but there is a threat of further fragmentation and disturbance which could affect natural processes.

Taxonomic notes: Genetic studies show that populations from all three forests (Dlinza, Ntumeni and

Bradypodion caeruleogula, Eshowe, KwaZulu-Natal province (© L. Kemp).

Bradypodion caeruleogula, Eshowe, KwaZulu-Natal province (© L. Kemp).

Ngoya) belong to this taxon (Tilbury and Tolley 2009). *Other important names*: none.

Distribution: Occurs in three forest patches (Ntumeni, Dlinza and Ngoya) in KwaZulu-Natal province, South Africa (Tilbury & Tolley 2009; Tilbury 2018). It has been recorded from well-vegetated gardens and road verges that border the forest, but not across the broader transformed landscape. *EOO*: 230 km^2; *AOO*: 108 km^2; *Distribution*: 44.5 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A Forest inhabitant, preferring the high canopy or high perches in small trees (Tolley & Burger 2007). *Habitat*: Forest.

Threats: Threats relate to habitat loss and degradation as a result of silviculture, agriculture and urban expansion, and the broader landscape is heavily impacted by subsistence activities (Skowno et al. 2019). Ntumeni and Dlinza have declined in extent by about 50% and the original forest matrices are no longer intact (Schoeman et al. 2013). Each forest is suspected to be a location, all under separate threats of habitat transformation. The three forests are gazetted as protected areas. *Use and trade*: Although this species was not previously in the pet trade, there have been recent advertisements online (2018) where it was for sale. It is listed in CITES Appendix II, with international trade regulated through CITES. However, given the level of threat to this species, local and international trade must be monitored, and individuals should not be removed from the wild for trade.

Population trend: The population is suspected to be in decline and is considered severely fragmented. The three subpopulations are small and lack connectivity. The loss of ecological integrity within Dlinza and Ntumeni forests suggest those subpopulations, which hold about two-thirds of the population, may not be viable into the future.

Conservation and research recommendations: This species is listed in CITES Appendix II and on the South African National Sensitive Species List (http://nssl.sanbi.org.za/). Although all three forests where it occurs are formally protected, human impacts in the area have caused destruction of original forest and degradation of existing forest, particularly at Ntumeni. Conservation of this species should therefore target habitat protection and minimise encroachment.

Family **Chamaeleonidae**

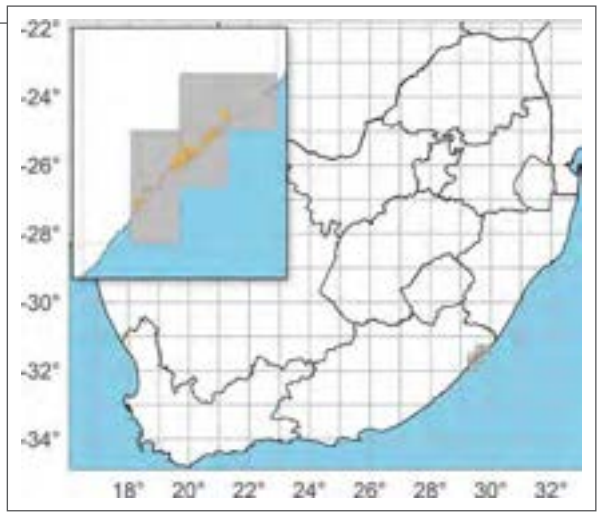
Bradypodion caffrum (Boettger, 1889)

Pondo Dwarf Chameleon

South African endemic

EN – Endangered B1ab(ii,iii,iv) + B2ab(ii,iii,iv) (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Endangered (Global IUCN assessment).
2017: Endangered (Global IUCN assessment).
2014: Endangered (SARCA).
2010: Endangered (Global IUCN assessment).

Assessment rationale: This species has a restricted distribution in coastal forest that is naturally patchy, but much of this area has been transformed. The existing forest patches are small and the subpopulations within are suspected to be isolated. Due to a lack of locality data and knowledge of threats, there is uncertainty regarding the number, spatial extent and degree of connectivity of the subpopulations, as well as whether the declines are significant. However, taking a precautionary approach, the population is considered severely fragmented, with more than 50% of the individuals occurring as small, isolated subpopulations that may not be viable. Transformation (both urban and rural) is ongoing (Skowno et al. 2019), leading to a decline in the extent and quality of the AOO. To date, the EOO has not been recorded to have declined in extent, but there is a decline in habitat quality for the EOO.

Taxonomic notes: In the original description of this species, the specific name *caffer* was used, with no indication if it was an adjective or noun. With subsequent changes in genus status, the specific name continued to be used (Hewitt 1935; Klaver & Böhme 1997), later transferred to gender neutral specific epithet *caffrum* by Raw (2022). The closely related population at Mkambati in the Eastern Cape province appears to be a Grassland ecomorph of this otherwise forest-dwelling species (K.A. Tolley, unpubl. data 2019), but more research is needed to assess the taxonomic status of this population. *Other important names*: *Bradypodion caffer*.

Distribution: This species is distributed in the narrow coastal forest belt in northeastern Eastern Cape province, South Africa (Tolley & Burger 2007; Tilbury

Bradypodion caffrum, female colouration, Port St Johns, Eastern Cape province (© K.A. Tolley).

Bradypodion caffrum, male colouration, Port St Johns, Eastern Cape province (© K.A. Tolley).

Bradypodion caffrum, male colouration, Port St Johns, Eastern Cape province (© K.A. Tolley).

2018). It has been recorded from forest patches north of Port St Johns, southwards to Hluleka Nature Reserve. The distribution may be more extensive, as there are additional forest patches in the area, but there are no records from these patches, so they are currently not mapped as part of the range. There is a closely related population north of Port St Johns (i.e., Mkambati Nature Reserve) that is morphologically different and occupies the Grasslands, but the taxonomic status is uncertain, so this population is not included in the current assessment. *EOO*: 422 km^2; *AOO*: 300 km^2; *Distribution*: 120 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Inhabits Coastal Forests where it occurs high in trees, but also can be lower down on bushes and shrubs (Tolley & Burger 2007). This chameleon does not tolerate habitats that are severely altered (e.g., agricultural landscape) but does occur in vegetated peri-urban areas. *Habitat*: Forest.

Threats: Occurs within a highly fragmented, vulnerable ecosystem (Skowno et al. 2019). This area is heavily transformed, mainly through rural subsistence farming in a densely populated region. Only 8.3 km^2 of the distribution is under formal protection in the Silaka Nature Reserve and Hluleka Nature Reserve. The AOO has declined due to fragmentation and loss of forest. *Use and trade*: There is very little legal trade in this species, with CITES reporting the export of only 22 individuals, all from 2010 (UNEP-WCMC 2020).

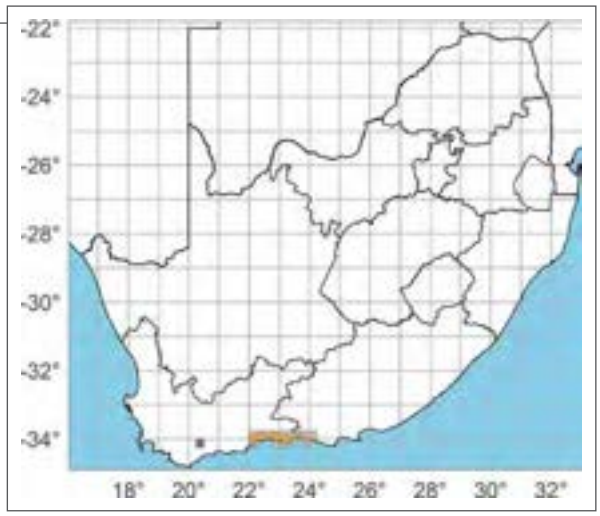
Population trend: Due to severe habitat fragmentation, it is suspected that more than 50% of the individuals occur as small and isolated subpopulations with no immigration or gene flow between patches, and these subpopulations may not be viable into the future.

Conservation and research recommendations: This species is listed in CITES Appendix II with international trade regulated. Field surveys are needed to provide a better estimate of AOO, especially in previously non-surveyed forest patches that are embedded within the current EOO. Better knowledge of the occurrence of the species with respect to fragmentation of habitat is needed, as well as an assessment of the degree of connectivity between patches. An examination of populations in fragmented habitats for signs of genetic bottlenecks would allow for an assessment of whether the species is able to persist in small land patches and/or corridors.

Family **Chamaeleonidae**

Bradypodion damaranum (Boulenger, 1887)

Knysna Dwarf Chameleon



South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Much of the original forest habitat has been transformed into wood plantations, but the conversion of natural habitat has ceased, and in some areas, rehabilitation is taking place. This chameleon can also tolerate some well-vegetated peri-urban habitats.

Taxonomic notes: There is an isolated population of a similar species at Grootvadersbosch Forest, 150 km west of *B. damaranum* (Tolley & Burger 2007). Although morphologically similar in appearance, a phylogenetic analysis shows that they are separate taxa (Tolley et al. 2006, 2022b). The Grootvadersbosch population has been formally described as a separate species (Tolley et al. 2022b). *Other important names*: none.

Distribution: Has a moderate-sized range along the south-facing forested slopes of the Outeniqua

Bradypodion damaranum, female colouration, Storms River, Eastern Cape province (© K.A. Tolley).

Bradypodion damaranum, male colouration, George, Western Cape province (© L. Kemp).

and Tsitsikamma mountains in the Western and Eastern Cape provinces of South Africa (Tolley & Burger 2007). Records from the town of Swellendam (200 km west of the natural distribution, shown by a purple grid square on the map) represent an introduced, established subpopulation (Tolley 2020a) that is not included as part of the EOO. There is a recent extralimital record from Stellenbosch, 400 km from the main distribution (Tolley 2020b) not shown on the map. *EOO*: 7 330 km^2; *Distribution*: 3 110 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in coastal Afrotemperate forest (Tolley & Burger 2007). Is usually high up in the canopy but sometimes found lower, on smaller trees and bushes. Also inhabits well-vegetated peri-urban gardens. *Habitat*: Forest.

Threats: Although there was substantial habitat transformation of the indigenous forest in the past, that threat has slowed significantly, and some of the remaining forest fragments are in protected areas. *Use and trade*: There is very little legal trade in this chameleon, with CITES exports totalling only 55 individuals up until 2016 (UNEP-WCMC 2020). However, because it is extremely colourful, it is commonly removed from the wild by the public and taken as a household pet.

Population trend: Despite the past decline in population due to reduction in forest habitat, rates of transformation have ceased. Overall, the extent of habitat transformation is relatively small in relation to the large range of this species, and this chameleon is also tolerant of peri-urban habitat. It is thus assumed that previous local population declines do not pose a risk to the species.

Conservation and research recommendations: No recommendations.

Family **Chamaeleonidae**

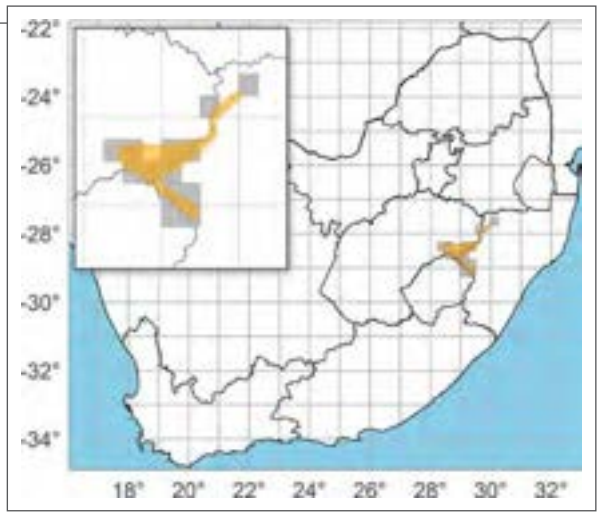
Bradypodion dracomontanum Raw, 1976

Drakensberg Dwarf Chameleon

South African endemic

NT – Near Threatened B1b(iii) (Global)

Assessor: Tolley, K.A.



Previous Red List categories:

2018: Near Threatened (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: This species has a moderate-sized distribution, but much of the potential available habitat has not been fully surveyed and it is possible that the distribution is wider than currently estimated. Approximately 20% of the known distribution is within protected areas, mainly the uKhahlamba-Drakensberg National Park. Most of the remaining range is poorly protected (Skowno et al. 2019) and is moderately to highly fragmented with a loss in habitat quality due to human activities.

Taxonomic notes: There has been some confusion between *B. dracomontanum* and an undescribed species (Emerald Dwarf Chameleon). Both occur in the Drakensberg, but *B. dracomontanum* occurs from Cathedral Peak northwards, whereas the Emerald Dwarf Chameleon occurs to the south of Cathedral Peak (Tolley & Burger 2007; Da Silva & Tolley 2017). *Other important names*: none.

Distribution: Occurs in the Drakensberg range of KwaZulu-Natal province and the eastern Free State province, South Africa, from Cathedral Peak northwards to Normandien Pass, and as far west as Golden Gate Highlands National Park (Tolley & Burger 2007). The forests where the species occurs are naturally fragmented over the larger landscape. *EOO*: 12 210 km^2; *Distribution*: 5 340 km^2.

Bradypodion dracomontanum, Monk's Cowl, KwaZulu-Natal province (© L. Kemp).

Bradypodion dracomontanum, Royal Natal National Park, KwaZulu-Natal province (© K.A. Tolley).

Country of occurrence: South Africa.

Habitat and ecology: Occurs mainly in small, isolated Forest patches, generally above 1 500 m a.s.l. The species is known to venture into the Grasslands surrounding Forest patches, but this is unlikely to be primary habitat. *Habitat*: Forest, Grassland.

Threats: Although a large proportion of the distribution falls within protected areas, outside of these the habitat is moderately to highly fragmented by human activities (Skowno et al. 2019). Most of the area within the distribution has high potential for afforestation and the planting of crops, and human population density is expected to increase. Climate change could be an emerging threat for this species, with a predicted ± 70% reduction in suitable climate by 2050 under an optimistic scenario (Clark 2019). This is coupled to a predicted 20–30% loss of the currently remaining natural habitat in that same timeframe (Clark 2019). The interaction between these drivers results in this species being disproportionately sensitive to predicted global change. *Use and trade*: There is very little legal trade, with a limited number of individuals exported under CITES in 1995 (UNEP-WCMC 2020).

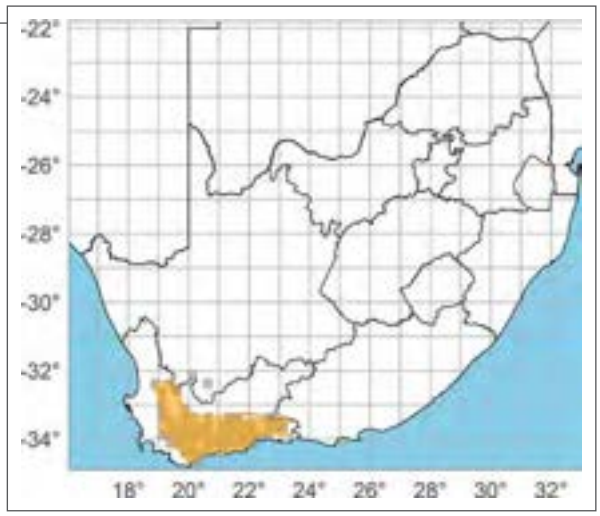
Population trend: Although there has been notable habitat loss over the larger landscape, a proportion of the range is within protected areas. Outside protected areas, the habitat has been degraded and transformed, which is likely to have caused local declines. Despite this, the large geographic range and occurrence in protected areas mitigates against the negative effects of local population declines.

Conservation and research recommendations: An improved assessment of the species' occurrence outside of protected areas would be beneficial for assessing the scope of local extinctions. Records outside of protected areas are few, and it is unclear whether this represents loss of subpopulations or poor collection data.

Family **Chamaeleonidae**

Bradypodion gutturale (Smith, 1849)

Little Karoo Dwarf Chameleon



South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This chameleon is widespread and common with no major threats.

Taxonomic notes: There are no taxonomic issues, but considerable morphological variation exists across the distribution of this species (Tolley & Burger 2007), and this can cause confusion for identifications. *Other important names*: none.

Distribution: Has a large distribution in southwestern South Africa (Tolley & Burger 2007), from lowlands in the west into the interior montane regions of the Cape Fold Mountains, although it does not occur in the high elevations of the Groot and Klein Swartberg mountains. *EOO*: 69 000 km²; *Distribution*: 47 600 km².

Country of occurrence: South Africa.

Habitat and ecology: Occurs in mountainous and low-lying areas in several vegetation types including Fynbos, Renosterveld and Karroid Vegetation (Tolley & Burger 2007). Not known to tolerate peri-urban settings. *Habitat*: Shrubland.

Threats: There is habitat alteration for urban development and agriculture in some areas of the distribution that would contribute to local declines. *Use and trade*: There is no known trade in this species at present, with minimal exports recorded by CITES only in 1992 (UNEP-WCMC 2020).

Population trend: The extent of habitat transformation is small in relation to the large range of this species. It is thus assumed that any local population declines do not pose a risk to the population.

Conservation and research recommendations: No recommendations.

Bradypodion gutturale, Ladismith, Little Karoo, Western Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

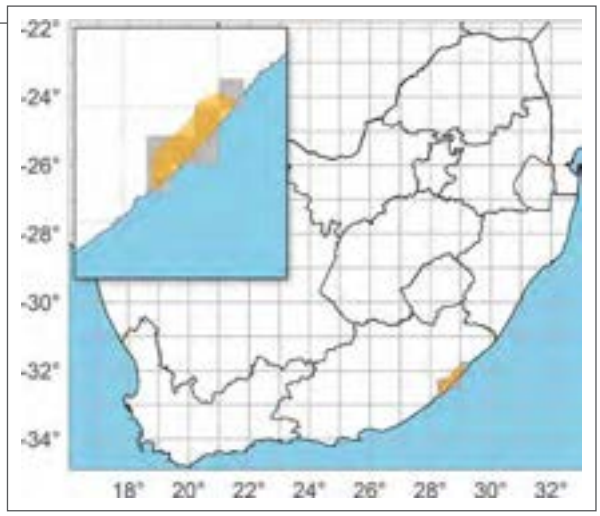
Bradypodion kentanicum (Hewitt, 1935)

Kentani Dwarf Chameleon

South African endemic

EN – Vulnerable B1ab(i,ii,iii) (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Near Threatened (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Has a small range that is impacted by rural settlements, small-scale agriculture and intense grazing, causing a continuing decline in the quality of habitat. Approximately 58% of the habitat has been transformed, and this has led to severe fragmentation of the population into dozens of small subpopulations between which immigration is unlikely and most of which are suspected to be not viable. Previously assessed as Near Threatened in 2017 based on a loss of habitat quality and extent, but severely fragmented was not invoked. Re-examination of the land cover and habitat transformation in concert with the ecology of the species suggest that most of the population occurs as small, isolated subpopulations with little chance of migration and gene flow. Thus, this population is now considered severely fragmented, which resulted in uplisting the species status to Vulnerable.

Taxonomic notes: Although there are no notable taxonomic issues (Tolley et al. 2004, 2006; Tolley & Burger 2007), this species is sometimes confused with *B. caffrum*, which occurs further north along the coastline. *Other important names*: none.

Distribution: Occurs in the eastern coastal areas of the Eastern Cape province, South Africa, from the vicinity of Kentani northwards along the coast to Dwesa Nature Reserve and Coffee Bay (Tolley et al.

Bradypodion kentanicum, forest ecomorph, Dwesa Nature Reserve, Eastern Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

Bradypodion kentanicum, grassland ecomorph, Gxarha, Eastern Cape province (© L. Kemp).

2006; Tolley & Burger 2007; Tilbury 2018). Occurs in naturally fragmented forest patches along the coast and extends about 30 km inland. *EOO*: 3 050 km^2; *Distribution*: 2 710 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Perches in trees and bushes of coastal scarp forest, as well as grasses inland from the Coastal Forest in the Savanna biome (Tolley & Burger 2007). Has been observed from road verges, so probably tolerates some degree of habitat transformation, but has not been recorded from severely overgrazed or other heavily impacted habitats. Thus, the degree of transformation that it tolerates is likely to be minimal and the potential for immigration between subpopulations is low. *Habitat*: Forest, Savanna.

Threats: The habitat is heavily impacted by subsistence agriculture and grazing, with some minor threat from silviculture, all of which are likely to have caused declines. In particular, the national land cover layer shows that the inland forest patches (e.g., Kentani Forest) and Grasslands have been heavily transformed. *Use and trade*: There is no known removal from the wild for trade (UNEP-WCMC 2020).

Population trend: The population is suspected to be declining due to habitat transformation. While the extent of connectivity is difficult to assess, it is unlikely to be substantial, so a precautionary approach is taken, and the population is considered severely fragmented. In particular, the subpopulations are probably very small and inherently lack resilience to stochastic events. As the habitat continues to decline in extent, the subpopulations will decline.

Conservation and research recommendations: There are relatively few records of this species, and an improved assessment of distribution and relevant threats is required, as the current and future habitat fragmentation might disrupt connectivity between subpopulations.

Family **Chamaeleonidae**

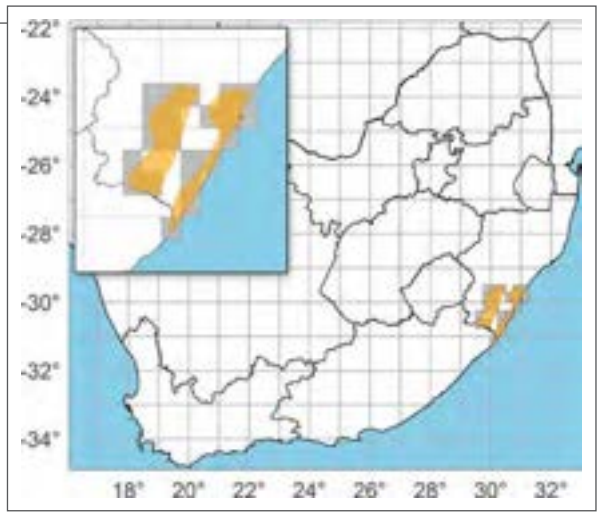
Bradypodion melanocephalum (Gray, 1865)

KwaZulu Dwarf Chameleon

South African endemic

NT – Near Threatened B1b(iii) (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Near Threatened (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Vulnerable (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Occurs in one of the most transformed regions of South Africa where there has been a decline in habitat quality and extent of habitat (Armstrong 2009; Skowno et al. 2019). The expectation is that pressure for land transformation in this area is likely to continue due to the projected human population density increases (Armstrong 2008, 2009; Skowno et al. 2019). Considered Vulnerable in 2014, the criteria were incorrectly applied as the population is not considered severely fragmented.

Taxonomic notes: This species is part of a larger species complex (including *B. melanocephalum* and *B. thamnobates*) in which genetic differentiation is low but obvious morphological differences exist (Da Silva & Tolley 2013, 2017). *Other important names*: none.

Distribution: Occurs in the coastal regions of KwaZulu-Natal province, South Africa, from north of Durban southwards to Umtamvuna Nature Reserve in the Eastern Cape province (Tolley & Burger 2007), reaching about 100 km inland. The inland subpopulation is morphologically, but not genetically, distinct from the coastal subpopulation and there is apparently a large gap in the distribution between the inland and coastal subpopulations (Da Silva & Tolley 2013, 2017). *EOO*: 15 490 km^2; *Distribution*: 8 690 km^2.

Country of occurrence: South Africa.

Bradypodion melanocephalum, Durban, KwaZulu-Natal province (© T. Ping).

Family **Chamaeleonidae**

Bradypodion melanocephalum, Hilton, KwaZulu-Natal province (© K.A. Tolley).

Habitat and ecology: Uses a wide array of vegetation including grasses, bushes, trees, roadside verges and urban gardens (Tolley & Burger 2007). *Habitat*: Savanna.

Threats: This species occurs in areas significantly impacted by land transformation, especially around the Durban municipal area (Armstrong 2008, 2009; Skowno et al. 2019). In addition, species distribution modelling suggest that this species could undergo a 40–60% loss of climatically suitable habitat by the end of this century (Houniet et al. 2009; Clark 2019). *Use and trade*: Legal trade in this species is minimal (UNEP-WCMC 2020) and unlikely to have a detrimental effect on wild populations at the current level.

Population trend: Although there are heavy anthropogenic impacts in some parts of this region causing habitat fragmentation, not more than 50% of the individuals are in small, isolated subpopulations. The species is somewhat tolerant of moderately transformed landscapes, as it is known to use urban gardens and road verges in well-vegetated neighbourhoods, which provides some connectivity. The population is therefore not considered to be severely fragmented. Due to ongoing habitat loss, it is likely that there are local declines.

Conservation and research recommendations: This species would benefit from a more thorough assessment of connectivity across its fragmented distribution.

Family **Chamaeleonidae**

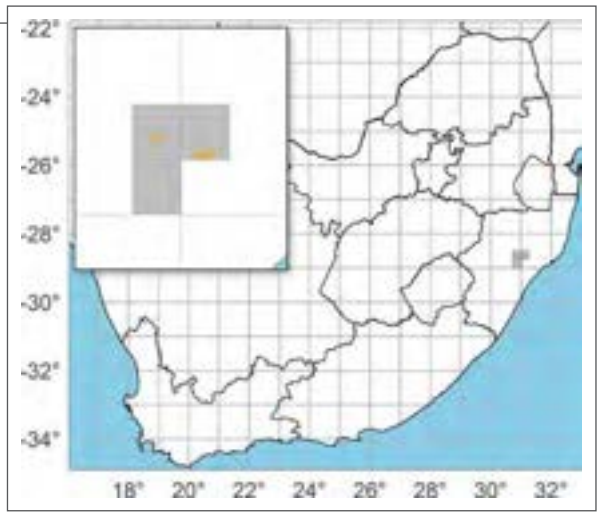
Bradypodion nemorale Raw, 1978

Qudeni Dwarf Chameleon

South African endemic

VU – Vulnerable D2 (Global)

Assessor: Tolley, K.A.



Previous Red List categories:

2018: Near Threatened (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Genuine.

Assessment rationale: This species has a small distribution, but it appears to be locally abundant in three isolated forest patches. Part of the range (Nkandla Forest, 33 km^2) is formally protected by provincial ordinance (Ezemvelo KZN Wildlife 2015) and not under threat (Geldenhuys 2000; Berliner et al. 2006). The subpopulation at Ntunjambili Forest is suspected to be very small given the size of this forest patch (1.25 km^2) and is unlikely to be viable in the long term, particularly as the forest is not protected. Qudeni Forest is gazetted as a State Forest, but the status only relates to sustainable use of forestry products and does not afford protection in terms of conservation. The South African Department of Forestry, Fisheries and the Environment has recently proposed to transfer ownership of state forests to local communities (https://pmg.org.za/committee-meeting/31235/; see also Ddlomo & Pitcher 2003; Ofoegbu & Speranza 2021). If this objective is realised, the fate of Qudeni Forest would rest on community-implemented decisions, and it is unknown how this would affect land conversion or privatisation of the indigenous forest. Thus, there is a plausible future threat of land conversion that could affect part or all of the forests in a short time (but see also Ofoegbu & Speranza 2017). For all of the forest patches, there is high anthropogenic

Bradypodion nemorale, Nkandla Forest, KwaZulu-Natal province (© L. Kemp).

Family **Chamaeleonidae**

Bradypodion nemorale, Nkandla Forest, KwaZulu-Natal province (© L. Kemp).

pressure on the surrounding landscape and there is forest degradation due to informal use of resources by the surrounding human population (e.g., Geldenhuys 2000). This could lead to the disruption of natural processes in the forest particularly at Ntunjambili and Qudeni forests, where at least half of the population occurs. The extinction risk for this chameleon is elevated due to its restricted range, coupled with the potential for land redistribution, which could result in forest loss affecting two forest patches. This could reduce the AOO by half and EOO by more than half. In the presence of an active threat of land conversion that could drive the species to a higher threat category in a short time, this species is considered to occur at three locations. Given the restricted range and the plausible threat of land conversion, criterion D2 applies, and this chameleon is considered Vulnerable because the Qudeni subpopulation is no longer secure and Ntunjambili population is considered to be in decline.

Taxonomic notes: Originally described from Qudeni and Nkandla forests (Raw 1978), although the Nkandla subpopulation was later described as *B. nkandlae* (Raw & Brothers 2008). This was based on juvenile specimens, which lacked clear diagnostic morphological differences with which to distinguish it from the Qudeni subpopulation. Phylogenetic studies showed a lack of divergence between chameleons from these two forests and as a result *B. nkandlae* was referred to synonymy of *B. nemorale* (Tilbury & Tolley 2009). The species is now known from three forest patches, which has been confirmed by genetic studies (K.A. Tolley, unpubl. data 2019). There is also a morphologically distinct but closely related undescribed species near Greytown. *Other important names*: *Bradypodion nkandlae*.

Distribution: This species is endemic to three small forest patches in KwaZulu-Natal province, South Africa (Tolley & Burger 2007; Tilbury 2018) that are 1.25, 24 and 33 km^2 in area. Until recently, this chameleon was only known from Qudeni and Nkandla forests but is now confirmed to also occur in Ntunjambili Forest near the town of Ntunjambili [Kranskop]. *EOO*: 648 km^2; *AOO*: 112 km^2; *Distribution*: 58 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in Afrotemperate and Scarp Forest and usually high in the canopy, although smaller individuals have been observed in the understorey (Tolley & Burger 2007). *Habitat*: Forest.

Threats: Although this species occurs as three isolated subpopulations, this fragmentation is natural. However, considering its small range, the species could be susceptible to natural and anthropogenic pressures with regard to the ecological integrity of the forests. Although Nkandla Forest is a protected area, afforestation for silviculture has impacted the original forest extent at Qudeni. Ntunjambili Forest is not under protection and is currently very small in area, possibly having been heavily reduced from its original extent due to human encroachment. There is a large human population in the area and as a result the environment is under heavy pressure from rural subsistence agriculture and resource extraction. While no additional pressure from commercial silviculture had been expected (Berliner et al. 2006), changing practices in forestry are a threat at Qudeni. This forest is gazetted as a state forest, set aside for sustainable forestry practices. Thus, the chameleon is not under protection at Qudeni, and the Department of Forestry, Fisheries and the Environment has recently proposed to transfer ownership of state forests to the local communities (https://pmg.org.za/committee-meeting/31235/; see also Dlomo & Pitcher 2003; Ofoegbu & Speranza 2021). Therefore, the fate of Qudeni Forest could eventually be decided through community-based land use decisions, and this does not preclude the further conversion or the privatisation of the indigenous forest. This constitutes a plausible future threat of land conversion that could affect part or the entire Qudeni Forest (but see also Ofoegbu & Speranza 2017) in a short time. Climate change could be an emerging threat for this species, with a predicted ± 70% reduction in suitable climate by 2050 under an optimistic scenario (Clark 2019). This is coupled to a predicted 50–60% loss of the currently remaining natural habitat in that same timeframe (Clark 2019). The interaction between these drivers results in this species being disproportionately sensitive to predicted global change. *Use and trade*: There is no known utilisation or trade of this species (UNEP-WCMC 2020).

Population trend: The subpopulations at Qudeni and Nkandla forests are considered viable at present, but the future of the subpopulation at Ntunjambili, which constitutes only a small portion of the population, is uncertain. Therefore, the population is not considered to be in decline (except at Ntunjambili), nor severely fragmented as more than 50% of the individuals are within viable subpopulations. Nevertheless, the subpopulations are considered to be isolated at present, and there is unlikely to be immigration between them.

Conservation and research recommendations: An assessment of the viability of the subpopulation at Ntunjambili Forest is urgently needed and this could be informed through dedicated surveys. The Ntunjambili and Qudeni subpopulations require urgent attention in terms of site protection.

Family **Chamaeleonidae**

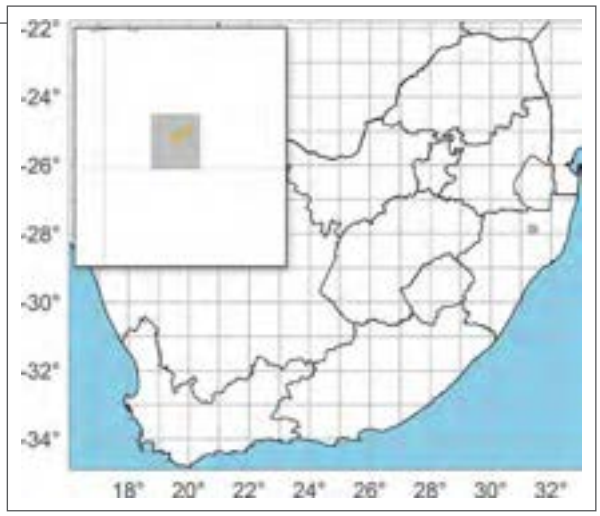
Bradypodion ngomeense Tilbury & Tolley, 2009

Ngome Dwarf Chameleon

South African endemic

VU – Vulnerable D2 (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Near Threatened (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Genuine.

Assessment rationale: This species occurs in one small forest in KwaZulu-Natal province, South Africa that is gazetted as a State Forest under the management of the Department of Forestry, Fisheries and the Environment (DFFE), and also falls within the Ntendeka Wilderness Area. It is suspected that the current adjacent area under silviculture was originally indigenous forest so there most likely has been some historical afforestation. There is some minor encroachment from the surrounding human community (I. van der Merwe, pers. comm. 2014). Transformation of the remaining indigenous forest into plantations had not been considered a serious threat because it was unlikely that additional licenses for water rights would be granted to allow for the plantations to expand (I. van der Merwe, pers. comm. 2014). Despite this, the DFFE now has a policy to fast-track afforestation licenses in KwaZulu-Natal province (https://www.gov.za/about-sa/forestry), and there have been recent parliamentary discussions aimed at the redistribution of state-owned forestry areas (i.e., state forests) to local communities (https://pmg.org.za/committee-meeting/31235/; see also Dlomo & Pitcher 2003, Ofoegbu & Speranza 2021). If this objective is realised, the fate of the indigenous forest would be under control of community-implemented decisions, and it is not known how this would affect land conversion or privatisation of the indigenous forest. Although there are no immediate threats to the core forest, there is a plausible future threat of land conversion that could affect part of or the entire forest within a short time. Therefore, the extinction risk for this chameleon is elevated due to its restricted range, coupled with the plausible potential for land redistribution that could

Bradypodion ngomeense, Ngome Forest, KwaZulu-Natal province (© D. van Eyssen).

result in forest loss. This is a naturally isolated population with a very small AOO and in the presence of an active threat, it is at one location. The realised threat of land conversion could drive the species to a higher threat category, or extinction, in a short time. Given the restricted range and the plausible threat of land conversion, criterion D2 applies, and this chameleon is considered Vulnerable because the small forest is no longer secure in terms of protection.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs only in a single, small forest patch (Ngome Forest) in KwaZulu-Natal province, South Africa (Tolley & Burger 2007; Tilbury & Tolley 2009; Tilbury 2018). *EOO*: 51 km^2; *AOO*: 64 km^2; *Distribution*: 33 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Perches high in Forest canopy, as well as smaller trees (Tolley & Burger 2007). *Habitat*: Forest.

Threats: Most of Ngome Forest is intact and the human population density within the immediately surrounding buffer area around the forest is low (Berliner et al. 2006). However, human density and habitat transformation across the overall region is high (Skowno et al. 2019) and could pose a threat in the future. Encroachment of pine trees into the buffer zone is possible and the forest edge is highly exposed with little natural transitional vegetation. About half the forest is within Ntendeka Wilderness Area, and Ngome Forest is gazetted as a state forest, but protection of this area seems tenuous at present. South Africa has a strong policy of land reform (https://www.gov.za/issues/land-reform) and even gazetted protected areas have been subject to land redistribution e.g., Vaalbos National Park was de-proclaimed in 2002 and redistributed to land claimants and the abolishment of Driftsands Nature Reserve has been proposed in favour of informal human settlement (e.g., Western Cape Government 2022). There are approximately 150 outstanding land claims against protected areas in South Africa (Qwatekana & Sibiya 2020), and there have been recent governmental discussions around transfer of ownership of State Forests to the communities. Given that the greater landscape is heavily settled, and the demand for land use change is potentially high, changes in land use practices could pose a serious and significant threat in the future. Climate change could be an emerging threat for this species, with a predicted 100% reduction in suitable climate by 2050 under an optimistic scenario (Clark 2019). This is coupled to a predicted 70% loss of the currently remaining natural habitat in that same timeframe (Clark 2019). The interaction between these drivers results in this species being disproportionately sensitive to predicted global change. *Use and trade*: There is no known trade in this species (UNEP-WCMC 2020).

Population trend: This species is unlikely to be in decline at present given that the forest it inhabits is currently intact.

Conservation and research recommendations: It would be useful to quantify the types and extent of pressures to the habitat outside the forest, as well as the spatial and temporal trends of human population density in the region. Official protection for the remaining patch of indigenous forest at Ngome is urgently required.

Bradypodion ngomeense, male colouration, Ngome Forest, KwaZulu-Natal province (© G.K. Nicolau).

Family **Chamaeleonidae**

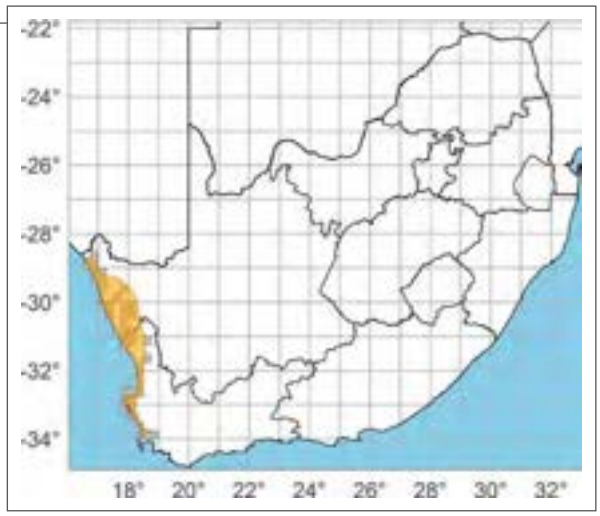
Bradypodion occidentale (Hewitt, 1935)

Western Dwarf Chameleon

South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A wide-ranging and abundant species with no major threats. Apart from the most southerly regions, most of its distribution is not heavily transformed.

Taxonomic notes: There are no major taxonomic issues, although a contact zone may exist between *B. occidentale* and *B. pumilum* and this could potentially result in hybridisation. *Other important names*: none.

Distribution: Distributed along the western margin of South Africa (Tolley & Burger 2007). In some areas, this chameleon may extend 100 km inland, depending on the availability of appropriate vegetation. There are a few extralimital records on citizen science platforms, approximately 150–200 km to the west. *EOO*: 55 000 km^2; *Distribution*: 29 200 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in undisturbed Strandveld vegetation along the coast and further inland in Succulent Karoo (Tolley & Burger 2007), as well as in Renosterveld in the south of the distribution. Perches in bushes, but often crosses bare ground between bushes. *Habitat*: Shrubland.

Threats: No known significant threats.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs mainly in areas that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Bradypodion occidentale, Namaqualand, Northern Cape province (© R. van Huyssteen).

Bradypodion occidentale, Noup, Northern Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

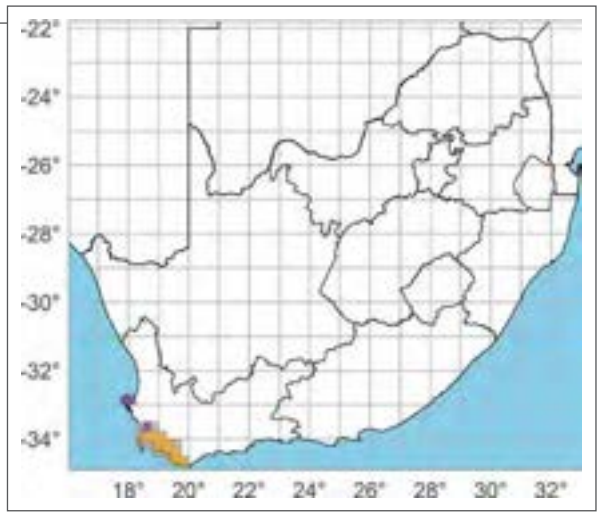
Bradypodion pumilum (Gmelin, 1789)

Cape Dwarf Chameleon

South African endemic

NT – Near Threatened B1b(iii) (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Near Threatened (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a moderate-sized distribution, with continuing decline in quality and extent of habitat over about half the range. The subpopulations in urban areas are fragmented and anecdotal information indicates that these urban populations are declining. Although previously assessed as Vulnerable due to severe fragmentation, an assessment of the sizes and spatial distribution of the habitat patches suggests that more than 50% of the population is not isolated into small subpopulations. Therefore, severely fragmented does not apply. Furthermore, the species is considered well protected (Tolley et al. 2019a), and this offers some resiliency for the species.

Taxonomic notes: Genetic studies show that there are at least two ecomorphs of *B. pumilum*, a colourful ornate form that inhabits the western side of the range across Cape Town and environs, and an inornate form that is found in the eastern portion of the range and inhabits Fynbos vegetation of the Cape Fold Mountains (Tolley et al. 2006, 2019b). *Other important names*: none.

Distribution: Occurs in the southwestern parts of the Western Cape province, South Africa, around the Cape Town region, extending eastwards onto the Agulhas

Bradypodion pumilum, ornate ecomorph, Cape Town, Western Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

Bradypodion pumilum, fynbos ecomorph, Kogelberg, Western Cape province (© K.A. Tolley).

Bradypodion pumilum, ornate ecomorph, Cape Town, Western Cape province (© C.R. Hundermark).

Plain (Tolley & Burger 2007; Tilbury 2018). Scattered records from just north of Cape Town (purple grid squares on map) are considered to be localised introductions (Tolley 2020b) and are not included as part of the distribution or estimation of the EOO given that these are unlikely to establish or persist. Introductions had been recorded from Namibia and Clanwilliam, South Africa, but these have not been confirmed in recent years (Tolley 2020b). *EOO*: 9 870 km^2; *Distribution*: 6 520 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in a variety of vegetation types including Fynbos, Forested Riparian Vegetation and some exotic and indigenous trees. The species shows some tolerance to peri-urban gardens and greenbelts. However, the extent of habitat degradation that it can tolerate is not known, nor are the factors that contribute to its continued survival in some peri-urban habitat patches. *Habitat*: Forest, Shrubland.

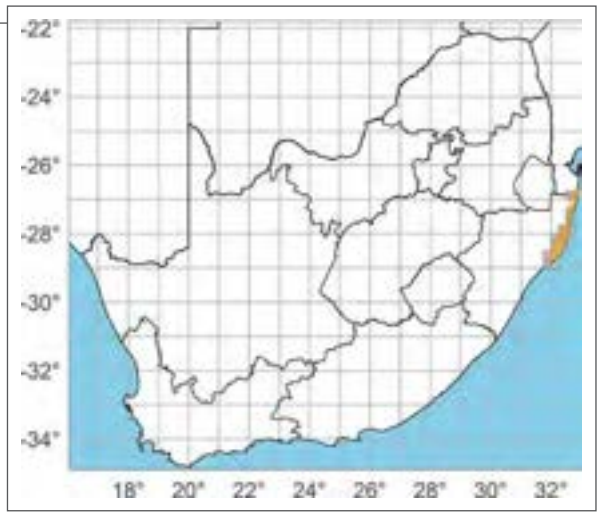
Threats: Habitat loss and transformation through urbanisation and agricultural sprawl have made portions of the range completely unsuitable. Despite this, the species does appear to persist in some, but not all, peri-urban areas. Other threats include predation by domestic cats (*Felis catus*) in peri-urban areas and the deliberate translocation of chameleons by the public. The impacts of these latter threats have not been quantified. *Use and trade*: The CITES trade database indicates minimal numbers have been legally exported from South Africa over the last decades for the pet trade (UNEP-WCMC 2020). However, the CITES permitted exports for the pet trade between 2010 and 2016 (122 individuals) outnumbered the total number exported between 1975 and 2009 (UNEP-WCMC 2020), which could indicate an increasing demand for this species.

Population trend: Through copious anecdotal information, an observable decline in the population has been noted over the last few decades over about half the range due to substantial urbanisation within the greater Cape Town municipal region. Despite the observed decline, the species shows some tolerance to peri-urban environments and small subpopulations are still persisting. There is potentially connectivity between these subpopulations via road verges and greenbelts, but the extent of connectivity has not been assessed. Although the subpopulations in the peri-urban environment might be severely fragmented, there is a large subpopulation in the nearby Cape Fold Mountains that is continuous and not severely fragmented. It is therefore most likely that more than half of the overall population does not occur as small, isolated subpopulations and the species cannot be considered severely fragmented.

Conservation and research recommendations: Given that the species can utilise peri-urban habitats, the planting of chameleon-friendly gardens would increase and link suitable habitat. However, an assessment of what factors enhance, or hinder, chameleon occurrences in the peri-urban setting is needed, as is an assessment of immigration between these small habitat patches.

Bradypodion setaroi Raw, 1976

Setaro's Dwarf Chameleon



Regional near-endemic

NT – Near Threatened B1b(i,iii) (Global)

Assessor: Tolley, K.A.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).
1996: Endangered (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Genuine.

Assessment rationale: About 70% of the range, especially the southern portion, is highly transformed and fragmented. The remainder is located within the iSimangaliso Wetland Park and World Heritage Site, where there is natural forest habitat providing connectivity for this forest specialist species. Given that much of the population is within a protected area and there could be connectivity with smaller patches outside the protected area, the population is not currently considered severely fragmented. However, the EOO in the south is likely declining and there has been a decline in the extent and quality of habitat across most of the range. In addition, there is an emerging threat of socioeconomically driven land invasion into the protected area by local communities, and this should be monitored. If this threat becomes active and given the relatively small EOO, much of which falls within the protected area, this species could rapidly become threatened. In addition, most of the range falls within poor quality habitat which cannot be utilised by this forest specialist. Taking a precautionary approach, this species is considered Near Threatened. Previously considered Least Concern under the assumption that more than 50% of the range was within the protected area, refinement of the range map suggests that this figure is closer to

Bradypodion setaroi, male colouration, St Lucia, KwaZulu-Natal province (© K.A. Tolley).

Family **Chamaeleonidae**

30% and most of the range is in degraded or fully transformed habitat. This, together with the emerging threat of socioeconomically driven land invasion into the protected area, have necessitated a change in status.

Taxonomic notes: No issues. *Other important names*: none.

Distribution: Occurs in northern, Coastal Forests of KwaZulu-Natal province, South Africa, and marginally in southern Mozambique (Tolley & Burger 2007). The southern records from Richards Bay were previously thought to represent introductions but given that coastal forest originally extended this far south, that population is possibly natural. *EOO*: 6 800 km^2; *Distribution*: 5 100 km^2.

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Occurs in the high canopy of trees and lower down in bushes of Coastal Dune Forests (Tolley & Burger 2007). *Habitat*: Forest.

Threats: This species is completely dependent on forest habitat, which is degraded outside of the iSimangaliso Wetland Park. About 30% of the range falls within this protected area, but despite the official protection status, the park has become vulnerable to the threat of socioeconomically driven land invasion by local communities. Given that other protected areas in South Africa have recently been de-gazetted due to land invasions in favour of informal human settlement (e.g., Western Cape Government 2022), this is a plausible emerging threat. The southern portion of the distribution is highly fragmented by subsistence agriculture and large-scale timber plantations, with forests in the extreme south having been completely transformed. *Use and trade*: No CITES export permits have been issued for this species (UNEP-WCMC 2020), although it can be found in the European pet trade on occasion. This suggests that the source of animals in the pet trade could be illegal in origin and as such changes in the frequency of animals in the pet trade should be monitored.

Population trend: About 70% of the range falls in areas that have significant habitat transformation, although a large portion (about 30%) is within a protected area that buffers the effects of habitat fragmentation and provides connectivity. At present, this buffering is presumed sufficient for the population to remain stable and not severely fragmented.

Conservation and research recommendations: There is an emerging threat of socioeconomically driven land invasion by local communities within protected areas which buffer this species from declines and severe fragmentation. Associated changes in land use and potential rapid habitat destruction will require careful monitoring. Given the possible illegal trade, the pet trade and CITES trade statistics should be monitored for changes.

Bradypodion setaroi, St Lucia, KwaZulu-Natal province (© L. Kemp).

Family **Chamaeleonidae**

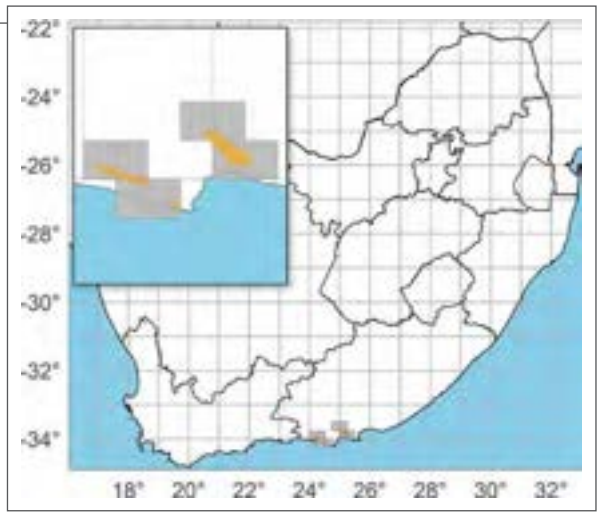
Bradypodion taeniabronchum (Smith, 1831)

Elandsberg Dwarf Chameleon

South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Endangered (Global IUCN assessment).
2014: Endangered (SARCA).
2010: Endangered (Global IUCN assessment).
1996: Critically Endangered (Global IUCN assessment).
1994: Endangered (Global IUCN assessment).
1990: Vulnerable (Global IUCN assessment).
1988: Vulnerable (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: Although this species has a small distribution, approximately half of the individuals are within a subpopulation on the eastern Tsitsikamma Mountains, largely in a protected area that is not facing any significant threats at present. There are several very small subpopulations along the Elandsberg Mountains, but these also are not under any significant threat at present. These latter subpopulations were historically fragmented by the conversion of habitat to pine plantation, which greatly reduced the original extent of the habitat. It is suspected that more than half the original habitat at Elandsberg has been lost, but this threat is not ongoing (K. Kirkman and W. Gysman, pers. comm. 2021). The remaining Fynbos habitat patches are intact, although the subpopulations are completely isolated by pine plantations. The species has presumably gone locally extinct in some parts of its historical lowland range (south of the montane populations) due to habitat loss. However, historical data are scant, and the original extent of the species in the lowlands is very ambiguous. Previously assessed as Endangered, this was based on the species being at three threat-defined locations and as having large fluctuations in the

Bradypodion taeniabronchum, Elandsberg, Eastern Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

Bradypodion taeniabronchum, Lady Slipper, Eastern Cape province (© G.K. Nicolau).

number of mature individuals. Re-examination of the landcover data and best knowledge suggests that there is one large subpopulation and several small ones (ranging in size from about 17 km^2 to less than 1 km^2) that are no longer under any specific ongoing threat. Extreme fluctuations in numbers of individuals were considered a threat in the previous assessments, but the effect of scale, or of ecology, were not considered. While the natural Fynbos habitat is fire prone and adult individuals are known to perish in fires, fires typically occur across areas that would not cause fluctuations for the entire population, only localised fluctuations. Furthermore, this species occurs naturally in this fire-prone habitat and is resilient to fire, having been observed to recover quickly in burnt areas. Given that the locations criterion is no longer applied, the Endangered category is no longer applicable. The longer-term amelioration of threat categories (i.e., from Critically Endangered in 1996 to Least Concern at present) can be attributed in part to new information, as the species was previously thought to only occur at Elandsberg but is now known from a large subpopulation at the Tsitsikamma Mountains. The improvement in threat status can also be attributed to the ceasing of habitat transformation and improved management of the small subpopulations at Elandsberg. The remaining Fynbos habitat patches are conserved by the plantation management, and fire is carefully managed through a planned schedule of small block burns within the fragments of Fynbos where the isolated subpopulations occur (K. Kirkman, pers. comm. 2022). These factors together have promoted an improvement in threat category.

Taxonomic notes: Initial genetic studies suggested that two subpopulations are each more closely related to *B. ventrale* than they are to each other (Tolley et al. 2006), but this was based on a small dataset. A new, more comprehensive analysis using fine-scale genetic markers clearly shows that the *B. taeniabronchum* subpopulations are a single taxon, exclusive to *B. ventrale* (K.A. Tolley, unpubl. data 2021). *Other important names*: none.

Distribution: Occurs on two disjunct mountain ranges in South Africa, the Elandsberg and the Tsitsikamma Mountains (Tolley & Burger 2007). There are several isolated subpopulations on the Elandsberg and a single large subpopulation on the Tsitsikamma Mountains. There are a few occurrence records near the coast at Thyspunt Nature Reserve (owned by the South African power utility, Eskom) in the dune Thicket vegetation, but recent surveys could not confirm the presence of this subpopulation. Historical records suggest this chameleon also occurred in the surrounding lowlands with records at Schoenmakerskop and Van Stadens Wildflower Reserve near Gqeberha (Tolley & Burger 2004), but no additional records have been made in these areas for many decades. Schoenmakerskop was previously vegetated

with Fynbos but is now completely transformed. A recent thorough survey of Van Stadens Wildflower Reserve did not detect the species (K.A. Tolley, pers. obs. 2022). *EOO*: 3 250 km^2; *Distribution*: 521 km^2.

Country of occurrence: South Africa.

Habitat and ecology: This species uses low bushes and restios, primarily on mountain slopes (Tolley & Burger 2007) but has also been recorded from wetland vegetation (M. Burger, pers. comm. 2009). *Habitat*: Shrubland.

Threats: Although the species is known from only a few subpopulations, there are no significant threats to those subpopulations at present. While the Elandsberg subpopulations have undergone a historical decline due to conversion of the Fynbos habitat to pine plantation, the remaining, isolated patches of Fynbos habitat are on private lands and within the Longmore Plantation (MTO Forestry (Pty) Ltd.), where they are protected and conserved by the plantation management. The Fynbos habitat patches are under burn rotations to encourage vegetation regeneration and health (K. Kirkman and W. Gysman, pers. comm. 2021). Natural fires are not considered a significant threat to the overall population as this species is adapted to the fire-prone habitat and subpopulations have been observed to quickly recover following a fire (K.A. Tolley and K. Kirkman, pers. obs. 2014). The Tsitsikamma subpopulation falls partly within a protected area, which should provide some resiliency for this species. *Use and trade*: No known trade in this species and no recorded CITES exports (UNEP-WCMC 2020).

Population trend: This species is suspected to have undergone a large population decline historically due to extensive habitat loss. However, this threat has ceased at present, and the species is not suspected to be undergoing further declines. Locally, there can be extreme fluctuations in numbers of individuals due to natural or managed fires, but subpopulations are known to recover quickly. It is suspected that more than 50% of individuals occur as a single subpopulation in a mountainous region (Tsitsikamma Mountains) that is currently not under threat. The other extant subpopulations at Elandsberg are estimated to have declined in number and extent in the past due to the conversion of natural habitat to plantations, resulting in just a few remaining, small and isolated subpopulations that can be considered severely fragmented. Historical lowland subpopulation(s) are presumed to be locally extinct, but the extent of that loss cannot be quantified due to lack of information on the occurrence of the original population in that region and the extent to which habitat loss affected the population in the lowlands. It is uncertain if the Thyspunt subpopulation is still extant.

Conservation and research recommendations: In areas where controlled burns are necessary for the maintenance of the fire-adapted Fynbos vegetation, burn rotation must be maintained with only small blocks being burnt and burn intervals exceeding four years to allow for the maturation of the veld and recolonisation by chameleons. Because the original extent of distribution is not known, it would be very useful to target surveys for recording any extant (but presumably isolated) subpopulations in the remaining patches of lowland Fynbos habitat.

Family **Chamaeleonidae**

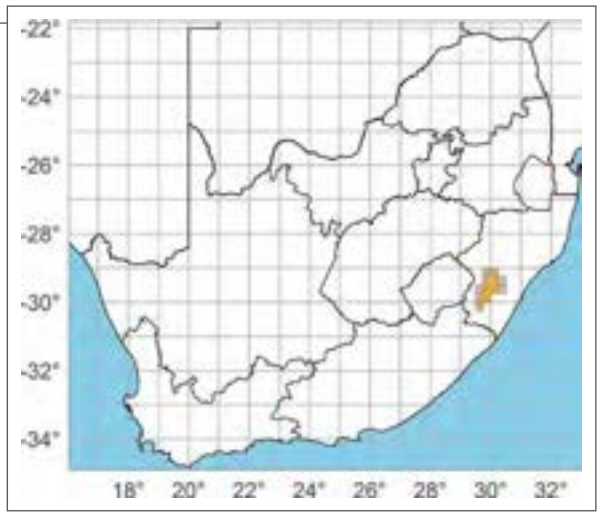
Bradypodion thamnobates Raw, 1976

Natal Midlands Dwarf Chameleon

South African endemic

EN – Endangered B1ab(i,ii,iii,v) (Global)

Assessor: Tolley, K.A.



Previous Red List categories:

2018: Endangered (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).
1996: Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: Although this species can be locally abundant, much of its range is highly transformed. The area is under heavy anthropogenic pressure from urbanisation, agriculture and silviculture (Skowno et al. 2019), and the species is considered poorly protected (Tolley et al. 2019a). There have been declines in the extent and quality of habitat throughout the range, affecting both the EOO and the AOO, and this threat has not ceased. It is suspected that more than half the population occurs as small, genetically isolated subpopulations, and that these are not viable into the future. The loss of subpopulations is suspected to result in a loss of mature individuals. In addition, collection from the wild for the pet trade is an emerging threat that would result in the loss of mature individuals from the population. Although previously assessed as Vulnerable, that category assignment was based on an overestimation of the EOO, and the species instead qualifies to be listed as Endangered.

Taxonomic notes: Recent genetic studies show that this species is part of the *B. melanocephalum* species complex. Based on mitochondrial DNA markers,

Bradypodion thamnobates, male colouration, Nottingham Road, KwaZulu-Natal province (© C.R. Hundermark).

there is low but diagnosable differentiation between these species (Da Silva & Tolley 2017). *Other important names*: none.

Distribution: This species has a small distribution in the KwaZulu-Natal Midlands, South Africa (Tolley & Burger 2007; Tilbury 2018). *EOO*: 4 610 km^2; *Distribution*: 4 170 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in remaining fragments of Southern Mistbelt Forest and appears to tolerate well-vegetated gardens and road verges, and small patches of thick, structured vegetation, even if this comprises exotic plants. Juveniles often perch on grasses and/or in more marginal habitat (Tolley & Burger 2007). *Habitat*: Forest.

Threats: Most of the habitat has been transformed due to agriculture, large-scale timber plantations (*Pinus* and *Eucalyptus* spp.), alien vegetation and urban residential development (Rouget et al. 2004b; Schoeman et al. 2013; Skowno et al. 2019). These chameleons can tolerate well-vegetated peri-urban areas, but overall, the land transformation is severe, the species has lost most of its habitat, and this threat has not ceased. Climate change could be an emerging threat for this species, with a predicted 50% reduction in suitable climate by 2050 under an optimistic scenario (Clark 2019). This is coupled to a predicted 60–70% loss of the currently remaining natural habitat in that same timeframe (Clark 2019). The interaction between these drivers results in this species being disproportionately sensitive to predicted global change. *Use and trade*: There have been some commercial exports of this species for the pet trade (UNEP-WCMC 2020), although until 2013 the numbers were minimal and were not expected to impact wild populations. Increases in the number of individuals exported have been recorded for the period 2014–2016, with 349 legal reported exports as opposed to only 74 in the period 1975–2013. However, unregulated targeted removals of mature individuals from the wild occur for the pet trade and this could conceivably affect entire subpopulations. Given the severe habitat fragmentation, subsequent recruitment from other habitat fragments is considered to be unlikely.

Population trend: Although individuals can be abundant in some peri-urban habitats, the population is considered severely fragmented due to substantial habitat transformation within its overall natural range, which has isolated more than 50% of the population in small subpopulations that lack connectivity. It cannot utilise the fully transformed landscapes, which now constitute most of its range. It is therefore inferred to be in decline due to the extreme loss of habitat, which has decreased the number of adult individuals. Removals from the wild for the pet trade is an emerging threat that results in the loss of individuals, including gravid adult females, and this could contribute to population declines.

Conservation and research recommendations: The potentially increasing trend of removal of individuals from the wild should be monitored and policed, and if necessary, non-detriment findings should be considered, as well as a Biodiversity Management Plan. Strict enforcement of CITES regulations should be applied. An assessment of the factors that contribute to the persistence of chameleons in some peri-urban habitats is needed to better assess the degree of connectivity and immigration.

Bradypodion thamnobates, Rosetta, KwaZulu-Natal province (© K.A. Tolley).

Family **Chamaeleonidae**

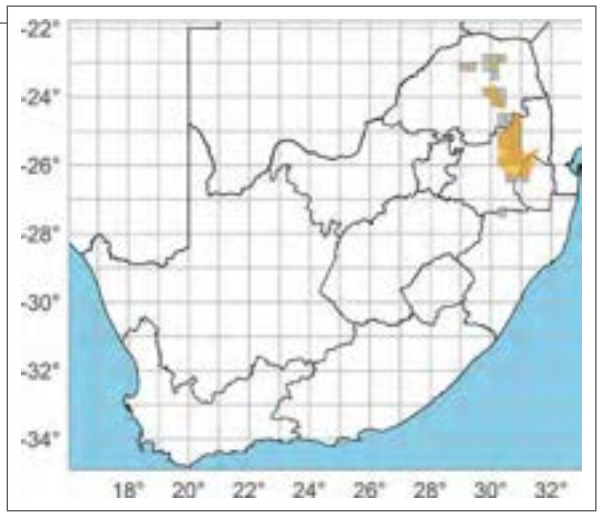
Bradypodion transvaalense (FitzSimons, 1930)

Wolkberg Dwarf Chameleon

Regional endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: This chameleon has a large distribution, which is naturally fragmented across relict forest patches. It can be abundant in well-preserved forest patches.

Taxonomic notes: Considerable morphological variation exists within this species (Tolley & Burger 2007) and it may contain multiple taxa (Jacobsen 1989). The subpopulations are monophyletic and genetic variation between these could be at the species level (see Tolley et al. 2004). *Other important names*: none.

Distribution: Occurs in naturally fragmented forest patches along the eastern Drakensberg escarpment and associated inselbergs as far north as the Soutpansberg range and into the highlands of Eswatini (Tolley & Burger 2007). The southernmost subpopulation occurs in a forest patch at Pongola Bush Nature Reserve, more than 100 km south of the main distribution. *EOO*: 77 000 km^2; *Distribution*: 16 500 km^2.

Bradypodion transvaalense, male colouration, Soutpansberg, Limpopo province (© K.A. Tolley).

Bradypodion transvaalense, male colouration, Woodbush Forest Reserve, Limpopo province (© K.A. Tolley).

Bradypodion transvaalense, Woodbush Forest Reserve, Limpopo province (© L. Kemp).

Bradypodion transvaalense, male colouration, Graskop, Mpumalanga province (© L. Kemp).

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Occurs in the canopy of forests that are usually at high elevations on mountain slopes and plateaus or in deep, forested gorges. It has also been recorded from forest edges, in peri-urban gardens and along road verges between 1 500 and 2 400 m a.s.l. These forests are naturally fragmented and connectivity leading to gene flow between patches is likely to be low. *Habitat*: Forest.

Threats: There are no substantial threats, although some forested areas within the distribution have been transformed, and this would have caused local declines. *Use and trade*: From 1975 to 2009, 145 individuals were exported for the pet trade, but from 2010 to 2016, this figure more than doubled, to 352 individuals (UNEP-WCMC 2020). Further increases in trade could pose a threat to this species.

Bradypodion transvaalense, Hangklip Forest Reserve, Limpopo province (© L. Kemp).

Family **Chamaeleonidae**

Bradypodion transvaalense, Woodbush, Limpopo province (© L. Verburgt).

Population trend: Although there has been some habitat loss in the region, the large geographic range and local abundance of this chameleon mitigates against the negative effects of population declines.

Conservation and research recommendations: Trade should be monitored for changes or increases. An assessment as to whether this species includes cryptic taxa should be made, and areas between the main distribution and the Pongola Bush Nature Reserve should be surveyed to assess whether the distribution is more continuous than is currently known.

Family **Chamaeleonidae**

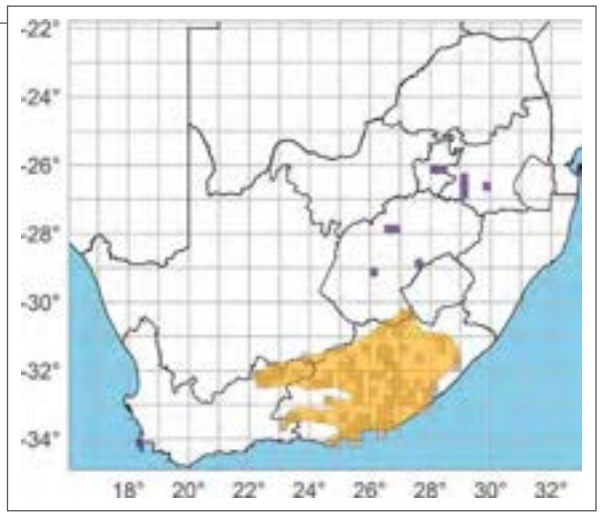
Bradypodion ventrale (Gray, 1845)

Southern Dwarf Chameleon

South African endemic

LC – Least Concern (Global)

Assessor: Tolley, K.A.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and abundant with no significant threats.

Taxonomic notes: In the western part of the distribution there appears to be a contact zone with *B. gutturale* (Tolley et al. 2006), but it is not known if these species hybridise in the wild. *Other important names*: *Bradypodion karrooicum*.

Distribution: Has a large distribution in the semi-arid regions of southeastern South Africa, into mesic regions in the east of the distribution (Tolley & Burger 2007). Introduced, established subpopulations occur in Bloemfontein (Free State province) and Johannesburg (Gauteng province) and there are recent extralimital records from Cape Town (Western Cape province), Standerton and Ermelo (Mpumalanga province) that might be established populations (Tolley 2020b). These introduced subpopulations (purple grid squares on map) are not considered as part of the range and have not been included in the estimate of EOO. *EOO*: 217 000 km^2; *Distribution*: 155 000 km^2 (indigenous range).

Country of occurrence: South Africa.

Habitat and ecology: Considered a habitat generalist and occurs in several biomes and vegetation types (Tolley & Burger 2007). Also has a wide climatic envelope (Houniet et al. 2009), which might facilitate establishment of extralimital populations. *Habitat*: Savanna, Shrubland.

Bradypodion ventrale, Gqeberha, Eastern Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

Bradypodion ventrale, Suurberg, Eastern Cape province (© K.A. Tolley).

Threats: There are no significant threats to this widespread and relatively abundant species. *Use and trade*: No known utilisation or trade.

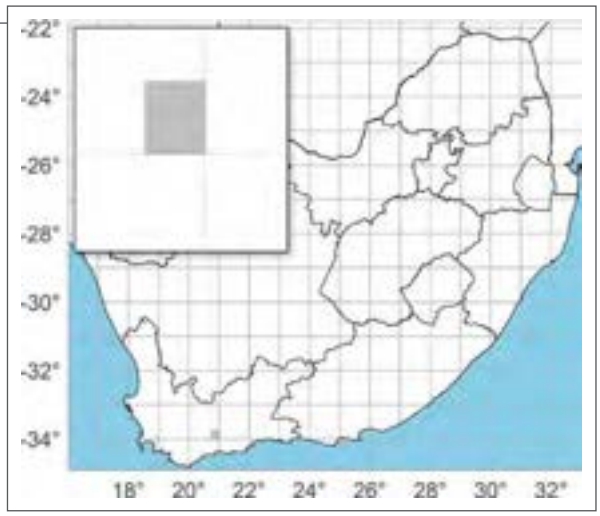
Population trend: The population size is assumed to be stable because this is a widespread and abundant species with large parts of the distribution not notably impacted by habitat transformation. Furthermore, there are several extralimital, established populations of this chameleon.

Conservation and research recommendations: New extralimital introductions and the establishment of new populations should be monitored.

Family **Chamaeleonidae**

Bradypodion venustum Tolley, Tilbury & Burger, 2022

Grootvadersbos Dwarf Chameleon



South African endemic

VU – Vulnerable D2 (Global)

Assessor: Tolley, K.A.

Previous Red List categories:
Not previously assessed.

Assessment rationale: This chameleon has a very restricted range, occurring only in a small forest patch (3.6 km^2) on the southern slopes of the Langeberg, South Africa. Most of the forest (2.5 km^2) lies within the Grootvadersbosch Nature Reserve, which is managed by the provincial nature conservation body, CapeNature. Despite this, the species is intrinsically threatened due to its small range size (± 3.6 km^2; AOO 8 km^2) and being at a single location. An unforeseen event, either due to human activities or to stochastic events, could cause this chameleon to become Critically Endangered or Extinct in a short period of time. Plausible direct threats relate to changes in land management that could negatively affect the forest quality and extent. Therefore, this species is listed as Vulnerable under the D2 criterion.

Taxonomic notes: This recently described species was previously considered as an isolated population of *Bradypodion damaranum* (Tolley et al. 2022). *Other important names*: none.

Distribution: Occurs in a small, isolated 3.6 km^2 patch of Afrotemperate forest at the foothills of the Langeberg approximately 40 km west of Swellendam, Western Cape province, South Africa (Tolley et al. 2022). Most of the forest (2.5 km^2) lies within the Grootvadersbosch Nature Reserve. This species has

Bradypodion venustum, Grootvadersbos, Western Cape province (© K.A. Tolley).

Family **Chamaeleonidae**

Bradypodion venustum, male colouration, Grootvadersbos, Western Cape province (© K.A. Tolley).

one of the smallest EOO and distribution sizes of any chameleon. *EOO*: 5.8 km^2; AOO: 8 km^2; *Distribution*: 4.3 km^2.

Country of occurrence: South Africa.

Habitat and ecology: The Langeberg where this species occurs lies in the transitional zone between winter and all year rainfall regions with an average annual rainfall of ±1 050 mm. The Forest is bordered by natural Fynbos to the north and by agriculture to the south. Although there are few observations, this species is considered a specialist of Afrotemperate Forest and does not occur outside the Forest. Despite wider searches, it has been recorded from only one small area within the Forest at ± 270–320 m a.s.l., so it is unknown whether other parts of the forest are suitable given their apparent absence in those areas.

Threats: There are few direct threats to this species at present, but because the range is very restricted, it is intrinsically at risk from stochastic events or sudden changes in land management. While the forest is under provincial and private protection, South Africa has a strong policy of land reform (https://www.gov.za/issues/land-reform). Protected areas are not immune to land redistribution, and a precedent has been established with other protected areas having been redistributed to land claimants (e.g., Vaalbos National Park de-proclaimed in 2002 and redistributed to claimants, and the abolishment of Driftsands Nature Reserve has been proposed in favour of informal human settlement [e.g., Western Cape Government 2022]). There are currently approximately 150 pending land claims lodged against protected areas in South Africa (Qwatekana & Sibiya 2020), demonstrating the tenuous future of protected areas.

Population trend: Given that most of the forest is currently under protection and that private landowners with forest on their properties have joined a conservancy (https://www.gvbconservancy.co.za/), the population is considered secure at present. Nevertheless, because of the small size of the forest the population size is suspected to be very small and is intrinsically at risk from stochastic events. There are inherent threats from Allee effects, inbreeding effects, strong genetic drift and declining genetic diversity (e.g., Ellstrand & Elam 1993; Luque et al. 2016; Kramer et al. 2018), which could negatively affect population demographics. Thus, it is unknown if this population is declining.

Conservation and research recommendations: This species has only been recorded from one small area within the forest, despite targeted searches in other areas. It is yet uncertain if it is more widespread throughout the forest, so additional surveys are urgently needed to assess the extent of the distribution. It would be useful to have improved knowledge on the ecological requirements of this species and to monitor for signs of population declines.

Family **Chamaeleonidae**

Chamaeleo dilepis Leach, 1819

Flap-necked Chameleon

LC – Least Concern (Regional)

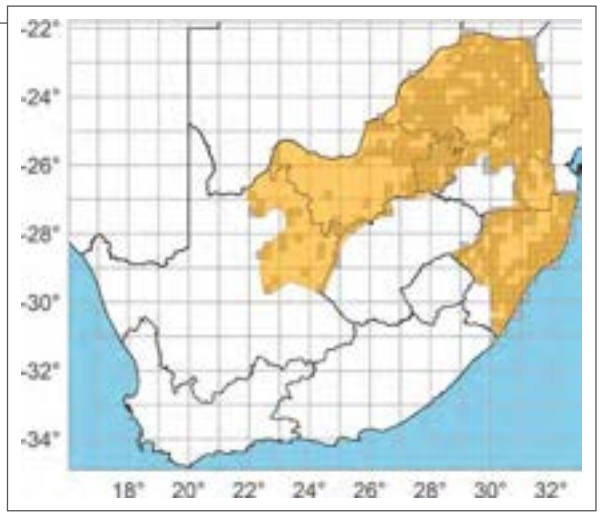
Assessor: Tolley, K.A.

Previous Red List categories:
2014: Least Concern (Global IUCN assessment).
2011: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Chamaeleo dilepis dilepis* – Least Concern (SARCA).

Assessment rationale: The species is widespread and common with no significant threats.

Taxonomic notes: A number of subspecies of *Chamaeleo dilepis* (*C. d. dilepis*, *C. d. idjwiensis*, *C. d. isabellinus*, *C. d. martensi*, *C. d. petersii*, *C. d. ruspolii*) are recognised, partly due to morphological variation across the very large geographic range (Klaver & Böhme 1997; Nečas 2004). The validity of these subspecies is unclear, and a detailed taxonomic revision of the species complex would be informative. A preliminary phylogenetic analysis suggests that there is species-level diversity within *C. dilepis* (Main et al. 2018, 2022). Included in the *C. dilepis* species complex are *C. roperi* and *C. quilensis*, but their taxonomic statuses also require further investigation. Tilbury (2018) considered all of the above-mentioned taxa, as well as *C. angusticoronatus*, as variants of a polymorphic *C. dilepis*. *Other important names*: See Tilbury (2018) for a summary of all synonyms and subspecies.



Distribution: *Chamaeleo dilepis* is the most widely distributed chameleon species, occurring from South Africa to East Africa, westwards to Cameroon and northwards to Ethiopia. In the region, it is widespread from the northern central regions, into the north-eastern regions and southwards into KwaZulu-Natal province (Tolley & Burger 2007; Tilbury 2018). *EOO*: 755 000 km²; *Distribution*: 464 000 km².

Chamaeleo dilepis, St Lucia, KwaZulu-Natal province (© T. Ping).

Family **Chamaeleonidae**

Chamaeleo dilepis, Pennington, KwaZulu-Natal province (© K.A. Tolley).

Countries of occurrence: Angola, Botswana, Burundi, Cameroon, Democratic Republic of the Congo, Equatorial Guinea, Eswatini, Ethiopia, Gabon, Kenya, Malawi, Mozambique, Namibia, Republic of the Congo, Rwanda, Somalia, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Usually perches high in bushes or trees in various vegetation types (Tolley & Burger 2007). Although it does not occur in Afrotemperate Rainforest, it does occur in Coastal Forest. *Habitat*: Forest, Savanna, Shrubland.

Threats: Although there has been some habitat loss due to urbanisation and agriculture that is assumed to have caused local declines in some subpopulations, this is not considered a major threat due to the wide range of this species. *Use and trade*: *Chamaeleo dilepis* is one of the most traded chameleon species (Jenkins et al. 2013), with over 178 000 permitted live individuals exported for trade since 1975 (UNEP-WCMC 2020). It is rarely legally exported from South Africa, with just over 600 individuals reported since 1975 and none reported in the last decade (UNEP-WCMC 2020). The scale of the illegal trade is not known. The species has also been reported to be widely used in traditional medicine (Williams et al. 2016).

Population trend: In South Africa, this species has declined due to habitat transformation in urban areas where it was previously common. However, the widespread range and abundance of this species mitigates against the negative effects of local population declines.

Conservation and research recommendations: A complete phylogenetic analysis covering the entire distribution and various subspecies should be undertaken to better inform the taxonomy. An evaluation of the impact of the high numbers of removals from the wild should be made.

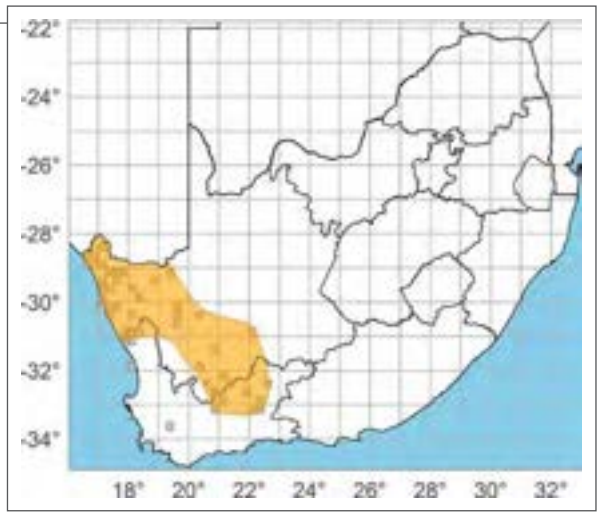
Family **Chamaeleonidae**

Chamaeleo namaquensis Smith, 1831

Namaqua Chameleon

LC – Least Concern (Regional)

Assessor: Tolley, K.A.



Previous Red List categories:
2014: Least Concern (SARCA).
2011: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread in the arid regions of Namibia and South Africa. Although not very common across most of the range, there are no major threats to most of its habitat.

Taxonomic notes: Although this species has been proposed to represent a separate, monotypic genus (Townsend & Larson 2002; Tilbury 2010), a phylogeny of the Chamaeleonidae clearly shows that *C. namaquensis* falls within *Chamaeleo* (Tolley et al. 2013). There are no outstanding taxonomic issues. *Other important names*: none.

Distribution: Occurs in arid regions in southwestern Africa, from southern Angola through western Namibia to the western half of South Africa (Tolley & Burger 2007), and there are scattered records to the south of the distribution that are apparently valid. May also occur in Botswana, although there are no records from that country. *EOO*: 213 000 km²; *Distribution*: 140 000 km².

Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: This chameleon is fully terrestrial, living on gravel plains and sandy substrates in arid regions (Tolley & Burger 2007; Tolley & Herrel 2013; Tilbury 2018). It typically seeks shelter under small bushes. *Habitat*: Desert, Savanna, Shrubland.

Threats: There are no substantial threats. *Use and trade*: This chameleon is listed on CITES Appendix II, and there are no recorded legal exports for trade (UNEP-WCMC 2020). Despite this it can be found for sale in Europe, strongly suggesting that there is illegal trade (C.V. Anderson, pers. comm. 2017).

Population trend: Because this chameleon occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: The global illegal trade should be quantified and monitored, and assessment of the origin of these chameleons is needed to assist in determining the potential illegal trade routes.

Chamaeleo namaquensis, Swakopmund, Namibia (© K.A. Tolley).

Chamaeleo namaquensis, Langer Heinrich, Namibia (© W. Conradie).

Family **Varanidae**

Varanus albigularis (Daudin, 1802)

Rock Monitor

LC – Least Concern (Regional)

Assessor: Alexander, G.J.

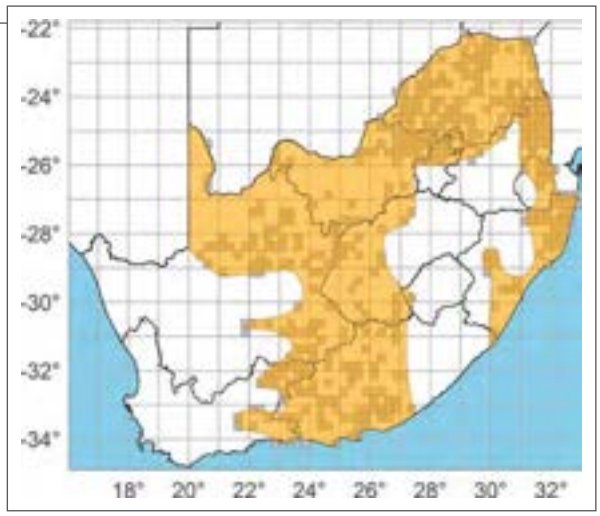
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Varanus albigularis albigularis* – Least Concern (Regional assessment).

Assessment rationale: Widespread and common, with no substantial threats.

Taxonomic notes: Although Broadley and Howell (1991) rejected all subspecies of *V. albigularis*, trinomials are now required as Broadley and Cotterill (2004) revived *V. a. angolensis* for monitors from northern Angola and adjacent Zambia and the Democratic Republic of the Congo. A third subspecies, *V. a. microstictus*, is recognised for Tanzania north to Somalia. A phylogenetic analysis comparing populations throughout the range would be informative for resolving subspecies status. *Other important names*: none.

Distribution: Occurs widely over the Savannas of southern and eastern Africa (Broadley 1966a; Bayless 2002). In South Africa, it occurs from Limpopo province southwards across most of the east and central regions. It is largely absent from the western parts of the Western Cape province and the central and western portions of the Northern Cape province and the Highveld Grassland in the central parts of South Africa. Some records from Lesotho (Ambrose 2006) and the Eastern Cape province of South Africa (Visser 1984g) require confirmation. *EOO*: 1 247 000 km²; *Distribution*: 713 000 km².



Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Djibouti,

Varanus albigularis albigularis, Dinokeng Game Reserve, Gauteng province (© L. Kemp).

Egypt, Eritrea, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Somalia, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs mainly in Savannas and arid areas over a wide range of elevations. It has an affinity for rocky outcrops and will climb trees (Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: Used in *muthi* (traditional medicine), but it is not known if this constitutes a significant threat as the species is widely distributed and abundant. *Use and trade*: This species is legally traded with over 1 000 live animals reportedly exported from southern Africa since 2005 (Sinovas et al. 2016). Although further research is required to quantify usage, it is likely that a large number of these animals are utilised in the *muthi* market (Williams et al. 2016) and this consumption does not form part of the CITES trade statistics.

Population trend: The population is stable; possibly expanding in the Northern Cape province, South Africa (Alexander & Marais 2007).

Conservation and research recommendations: An assessment of the level of utilisation for traditional medicine within South Africa would be useful.

Varanus albigularis albigularis, Pontdrift, Limpopo province (© L. Verburgt).

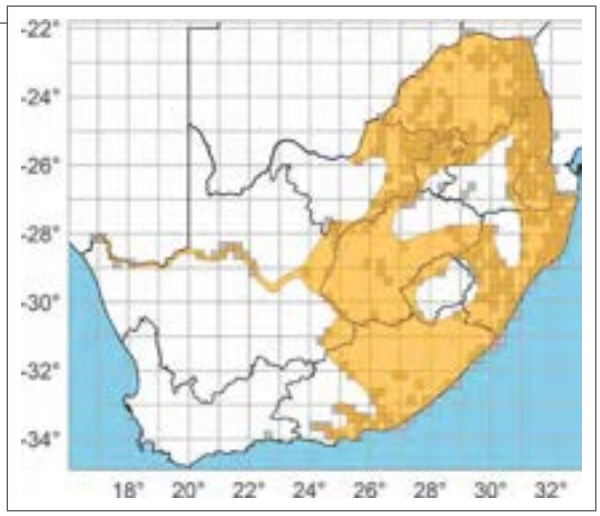
Family **Varanidae**

Varanus niloticus (Linnaeus, 1766)

Water Monitor

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: Widespread and common, with no known substantial threats.

Taxonomic notes: Although Böhme and Ziegler (1997) elevated *V. niloticus ornatus*, the large forest water monitor of the Congo Basin region, to a full species, a phylogenetic study indicated that this taxon should be considered a junior synonym of *V. niloticus* (Dowell et al. 2016). *Varanus niloticus* is likely to be a species complex whose taxonomy north of the equator remains unresolved (Dowell et al. 2015). *Other important names*: none.

Distribution: Occurs across most of sub-Saharan Africa, from the Nile River Delta southwards to South Africa, and from Somalia to Senegal (Bayless 2002). Although there are no known records from Eritrea, that country is listed as part of the distribution (Bayless 2002). In South Africa, it is distributed in the more mesic eastern and central regions, although it does extend west along the Orange River Valley to the coast. It reaches the southern limit of its distribution at the southern Eastern Cape province, South Africa. *EOO*: 1 258 000 km²; *Distribution*: 576 000 km².

Varanus niloticus, Pafuri, Kruger National Park, Limpopo province (© M. Petford).

Family **Varanidae**

Varanus niloticus, Umngazi, KwaZulu-Natal province (© T. Ping).

Countries of occurrence: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, The Gambia, Togo, Uganda, Zambia, Zimbabwe.

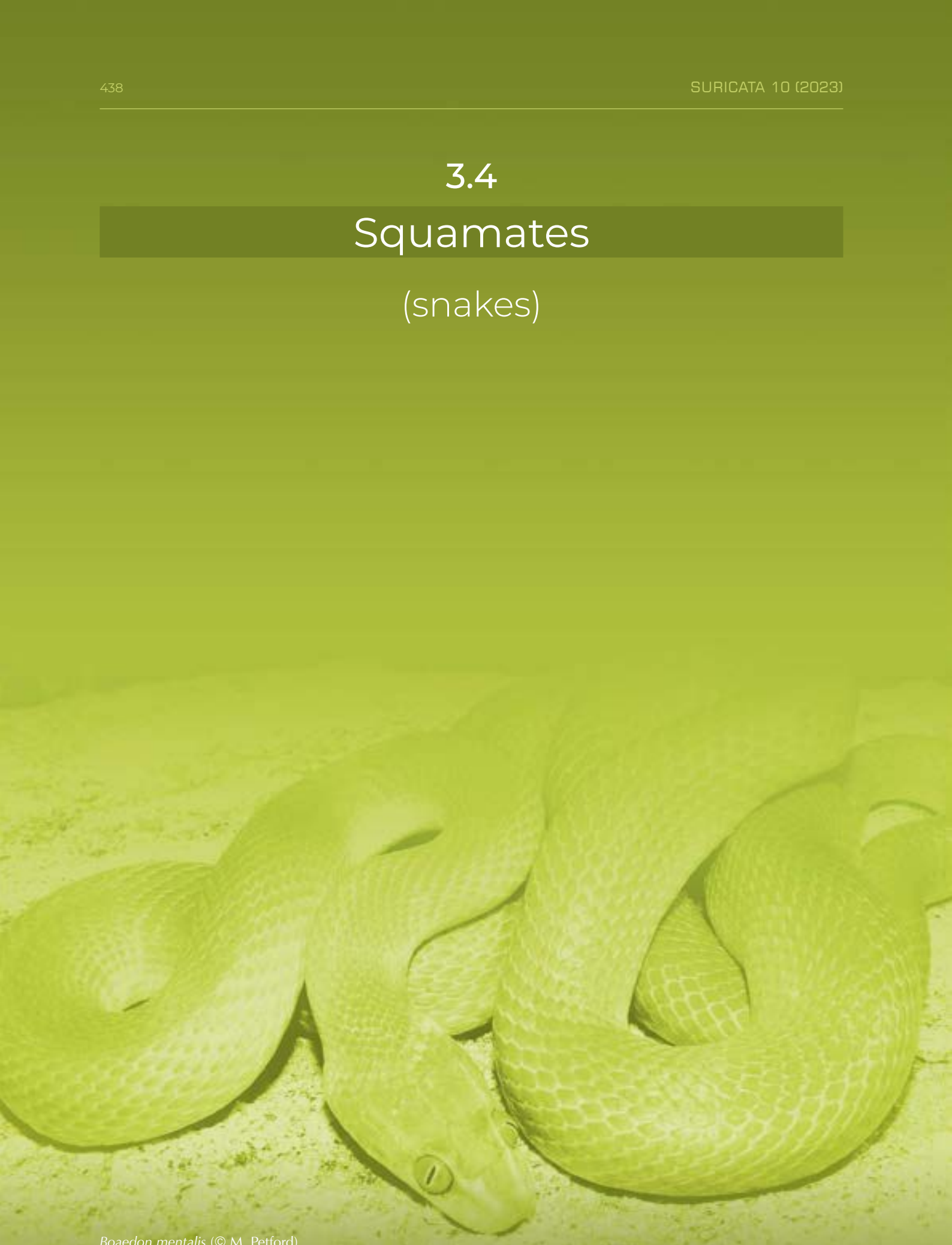
Habitat and ecology: Usually occurs in close proximity to water but may forage some distance from wetlands. Occurs over a wide range of elevations, from sea level to 1 700 m a.s.l. (Bourquin 2004). *Habitat*: Forest, Grassland, Savanna, Shrubland, wetlands.

Threats: It is likely that large numbers of these animals are utilised in the traditional medicine market (Williams et al. 2016), although the extent of this has not been quantified. This is unlikely to constitute a significant threat as the species is very widely distributed and is abundant. It is legally traded with over 1 050 live animals reportedly exported since 2005 (Sinovas et al. 2016).

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

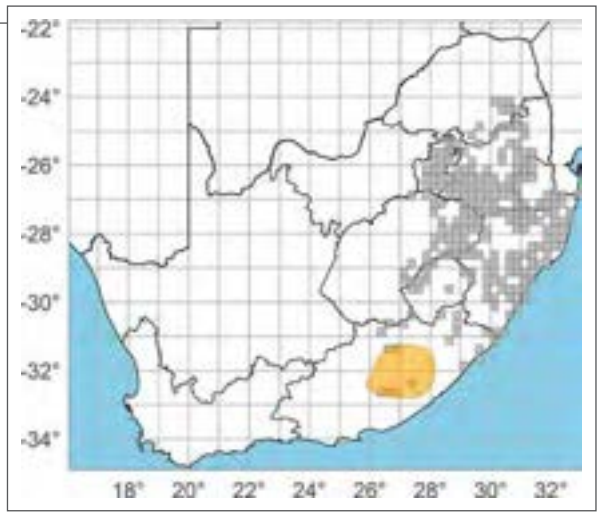
3.4
Squamates
(snakes)



Boaedon mentalis (© M. Petford).

Leptotyphlops conjunctus (Jan, 1861)

Cape Thread Snake



Regional endemic

LC – Least Concern (Global)

Assessors: Alexander, G.J., Tolley, K.A., Conradie, W., Pietersen, D.W., Weeber, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and generally common, with no major threats.

Taxonomic notes: The clade to which this species belongs (which includes *L. scutifrons, L. conjunctus* and *L. incognitus)* has a convoluted taxonomic history which is only now being unravelled with the use of phylogenetic analyses (Adalsteinsson et al. 2009; Busschau et al. 2021). Although initially treated as a full species by Broadley and Watson (1976), most subsequent authors have treated it as a subspecies of *L. scutifrons* (Branch 1998; Broadley & Broadley 1999; Broadley & Wallach 2009), although Adalsteinsson et al. (2009) reverted to treating it as a full species in a subsequent phylogenetic study of the group. Records from the Congo region originally assigned to this species were later reassigned to either *L. scutifrons* or *Namibiana latirostris* (Broadley & Broadley 1999). Recent phylogenetic analyses indicate that the species is paraphyletic, with at least three clades that are not sister groups, with divergences dating to 17–23 million years ago. Of these, the clade that occurs in the interior Eastern Cape province of South Africa can be considered *L. conjunctus sensu stricto*, given that the original type locality of 'Cape of Good Hope' has been restricted to the Eastern Cape province (Broadley & Watson 1976). This treatment would render two clades unassigned to any species. Until such time that the relevant taxonomic changes can be made,

Leptotyphlops conjunctus, Buffelsfontein, Penhoek Pass, Eastern Cape province (© W. Conradie).

Family Leptotyphlopidae

these two clades are included within *L. conjunctus sensu lato*. *Other important names*: *Leptotyphlops scutifrons conjunctus*.

Distribution: *Leptotyphlops conjunctus sensu stricto* occurs in the central regions of Eastern Cape province, South Africa. The additional clades that are currently assigned to this species appear to partition geographically. There is most likely an inland, high-elevation Grassland clade extending from the eastern Free State province and western Lesotho into the highveld areas of Gauteng and Mpumalanga provinces and the western highlands of Eswatini, and a clade along the eastern margin of South Africa, distributed mostly throughout the lower and mid-elevations of KwaZulu-Natal province (Broadley & Broadley 1999; Busschau et al. 2021). Although this assessment includes all the clades, the interpreted distribution (polygon on the map) refers to *L. conjunctus sensu stricto* only, with grid cells indicating the recorded localities for the additional, unassigned clades. *EOO*: 402 000 km^2; *Distribution*: 184 000 km^2.

Countries of occurrence: Eswatini, Lesotho, South Africa.

Habitat and ecology: Occurs in mesic habitats, ranging from sea level to Grasslands at high elevation (1 600 m a.s.l.) (Branch 1998). *Habitat*: Grassland.

Threats: There are no significant threats to this species.

Population trend: The population is not considered to be in decline given that this snake is widespread and relatively common with much of the range in areas not significantly impacted by habitat transformation.

Conservation and research recommendations: Further research is required to resolve the extremely complex taxonomy of this species.

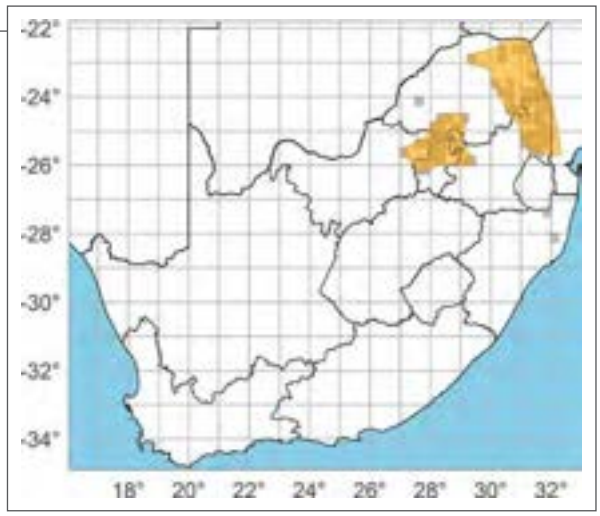
Leptotyphlops distanti (Boulenger, 1892)

Distant's Thread Snake

Regional near-endemic

LC – Least Concern (Global)

Assessor: Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: This species forms part of the *L. scutifrons* species complex (Broadley & Wallach 2007). The taxonomy of several species in the genus is in question (Adalsteinsson et al. 2009) as there is species-level diversity within described taxa as well as paraphyly of some currently recognised species. *Other important names*: none.

Distribution: Occurs across northern and eastern South Africa and adjacent southern Mozambique (Broadley 1990a; Broadley & Broadley 1999), possibly extending into Eswatini (Branch 1998), although it has not yet been recorded from there. Subpopulations in southern Limpopo and northern Gauteng provinces may be isolated from populations in the east. There are isolated records from northern KwaZulu-Natal province. *EOO*: 146 500 km^2; *Distribution*: 82 600 km^2.

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Occurs in mesic habitats, ranging from sea level to high-elevation Grasslands up to 1 600 m a.s.l. It has been recorded from under logs and stones and among the roots of grasses (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: There are no significant threats to this species.

Population trend: The population is not considered to be in decline given that this snake is widespread, abundant with much of the range in areas not significantly impacted by habitat alteration.

Conservation and research recommendations: The taxonomic status of the apparently isolated subpopulations requires further assessment.

Leptotyphlops distanti, Modimolle, Limpopo province (© R.I. Stander).

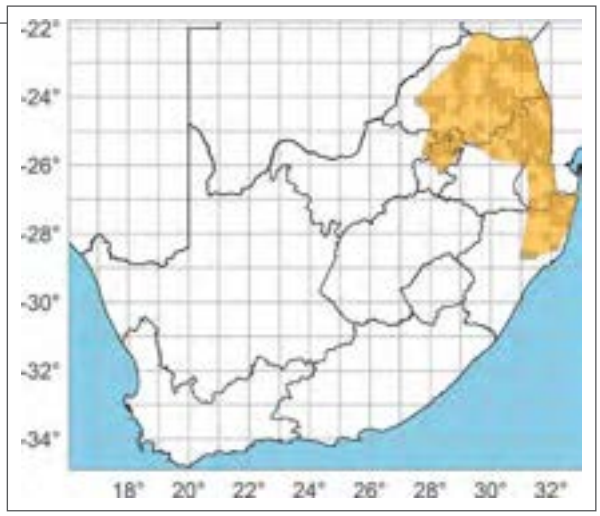
Family **Leptotyphlopidae**

Leptotyphlops incognitus Broadley & Watson, 1976

Incognito Thread Snake

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: The *L. scutifrons–L. conjunctus* species complex, which includes *L. incognitus*, has a complicated taxonomic history. Phylogenetic analyses indicate that there are numerous cryptic species within the complex, including within *L. incognitus* (Adalsteinsson et al. 2009). Additional work that includes topotypic material (Mutare, Zimbabwe) is required to assess the status of *L. incognitus*. *Other important names*: *Leptotyphlops conjunctus incognitus*.

Distribution: Across much of southern Africa, from southern Zambia and southern Malawi southward into northeastern South Africa (Broadley & Broadley 1999). In the region, it occurs throughout Eswatini and across most of northeast South Africa, as far south as central KwaZulu-Natal province. Given that this species is difficult to identify, outlying records in the south of the distribution (Jacobsen 1989; Broadley & Broadley 1999) are doubtful and these are currently excluded from the distribution map. *EOO*: 249 000 km^2; *Distribution*: 176 000 km^2.

Leptotyphlops incognitus, Hoedspruit, Limpopo province (© D.W. Pietersen).

Countries of occurrence: Eswatini, Malawi, Mozambique, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Shelters under rocks, in rotting logs and amongst the roots of grasses adjacent to boulders in mesic environments at elevations of 200–1 600 m a.s.l. (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: A more complete phylogenetic analysis could assist in resolving the taxonomy of the species complex.

Family **Leptotyphlopidae**

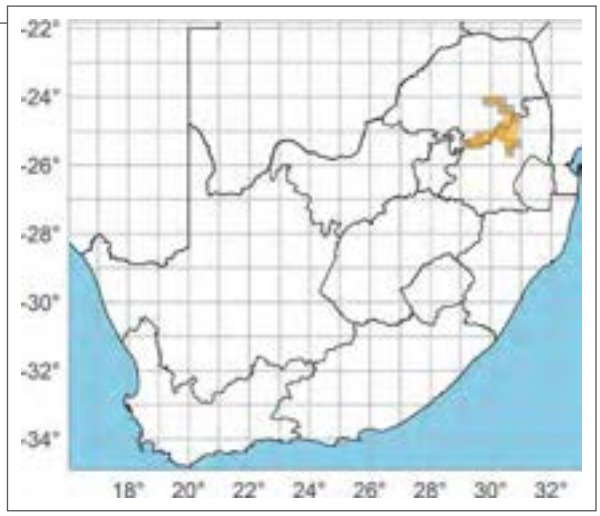
Leptotyphlops jacobseni Broadley & Broadley, 1999

Jacobsen's Thread Snake

South African endemic

LC – Least Concern (Global)

Assessor: Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Although the area in which this species occurs is transformed by agriculture and human settlements, the distribution is relatively extensive, which should mitigate threats.

Taxonomic notes: No taxonomic issues. *Other important names*: *Leptotyphlops nigricans nigricans*.

Distribution: Occurs in southern Limpopo and northern Mpumalanga province, South Africa (Broadley & Broadley, 1999). *EOO*: 22 600 km^2; *Distribution*: 10 800 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Occurs in high-elevation Grasslands (1 300–1 700 m a.s.l.) where it shelters under stones and in old termitaria (Jacobsen 1989; Broadley & Broadley 1999). *Habitat*: Grassland.

Threats: There are no significant threats to this species.

Population trend: The species is not considered to be in decline given that it is widespread and abundant, with portions of the range in areas not significantly impacted by habitat loss.

Conservation and research recommendations: No recommendations.

Leptotyphlops jacobseni, The Downs, Limpopo province (© W.D. Haacke).

Family **Leptotyphlopidae**

Leptotyphlops nigricans (Schlegel, 1839)

Black Thread Snake

South African endemic

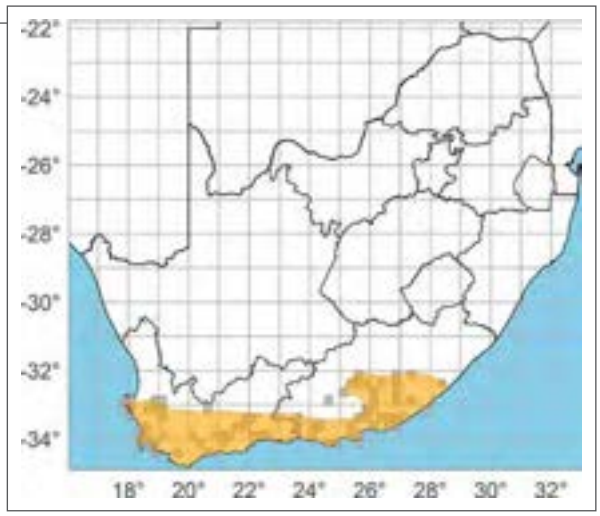
LC – Least Concern (Global)

Assessor: Alexander, G.J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: *Leptotyphlops nigricans* was restricted to the two southern Cape provinces (Broadley & Broadley 1999), but subsequent phylogenetic analyses showed deep genetic divergence between the Western Cape and Eastern Cape subpopulations that may indicate separate species (Adalsteinsson et al. 2009). The area of separation between the putative species is unknown as the distribution of *L. nigricans* is currently thought to be continuous (Broadley & Broadley 1999). *Other important names*: none.



Distribution: Distributed along the southern margin of South Africa in both mountainous regions and lowlands (Broadley & Broadley 1999). *EOO*: 195 000 km²; *Distribution*: 118 000 km².

Country of occurrence: South Africa.

Habitat and ecology: Strictly subterranean in habit, but little is known about its ecology. *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no significant threats to this species.

Population trend: The species is not considered to be in decline given that it is widespread and occurs in areas that are not significantly impacted by habitat loss.

Conservation and research recommendations: A comprehensive taxonomic study using a phylogenetic framework would be useful to assess the validity of the two putative species, as well as to define their respective ranges.

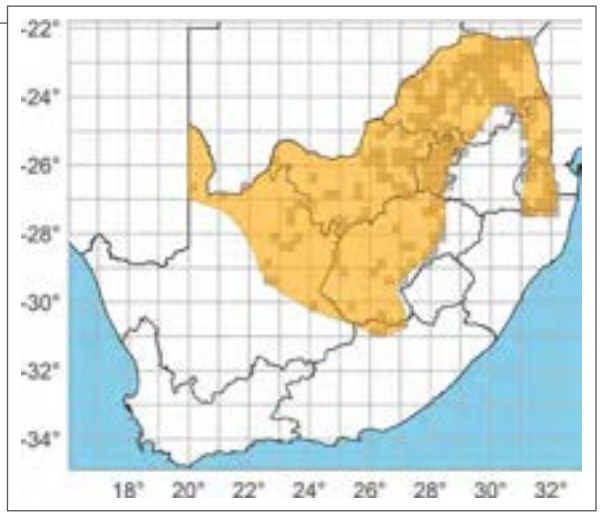
Leptotyphlops nigricans, Langebaan, Western Cape province (© C. & S. Dorse).

Leptotyphlops scutifrons (Peters, 1854)

Peters' Thread Snake

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: The group to which this species belongs, including *L. conjunctus* and *L. incognitus,* has a long and convoluted taxonomic history, which is only now being unravelled with the use of molecular analyses (Adalsteinsson et al. 2009). Molecular phylogenetics show numerous undescribed cryptic species within the complex that require more detailed analysis, and it is currently unclear which of these putative taxa is referable to the type specimen. *Other important names*: none.

Distribution: Occurs across southern Africa from southern Malawi west to southern Angola and south to South Africa (Broadley & Broadley 1999). In the region, it is very widespread across the eastern and central regions, although there is a distribution gap in the higher elevations of Lesotho. There is some overlap in the interpreted distribution of the subspecies in South Africa, although *L. conjunctus* is mostly in the east and *L. scutifrons* is mainly in the west (Broadley & Broadley 1999). The recorded overlap in distribution may be due to taxonomic confusion and the difficulty in distinguishing between taxa using only morphological traits. *EOO*: 819 000 km^2; *Distribution*: 500 000 km^2.

Leptotyphlops scutifrons, near Kuruman, Northern Cape province (© L. Verburgt).

Countries of occurrence: Angola, Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Fossorial, found in a wide variety of soil types (Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: A more complete phylogenetic analysis would assist in resolving the taxonomy of the species complex.

Family **Leptotyphlopidae**

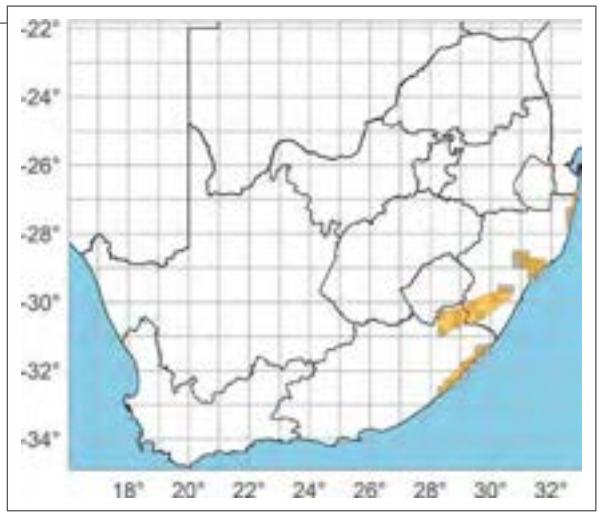
Leptotyphlops sylvicolus Broadley & Wallach, 1997

Forest Thread Snake

South African endemic

LC – Least Concern (Global)

Assessor: Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Data Deficient (Global IUCN assessment).
2014: Data Deficient (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species is restricted to forest patches, most of which are small and isolated (excluding populations in the interior of the Eastern Cape province, which are associated with Grassland and likely represent an undescribed species). The isolated forest patches may also have become more fragmented due to the deforestation resulting from coastal development, causing a continued decline in habitat quality and extent. Nevertheless, the large EOO buffers against extinction risk resulting in a Least Concern status despite the threats of habitat loss within its range. Although previously assessed as Data Deficient, improved sampling has allowed for the species to be reassessed.

Taxonomic notes: Broadley and Broadley (1999) recorded *L. sylvicolus* from three isolated subpopulations in forest habitats on the east coast of South Africa. Recent records from Grassland habitat in the former Transkei, South Africa, are of specimens that do not fully conform to the morphology of this

Leptotyphlops sylvicolis, Dwesa Nature Reserve, Eastern Cape province (© W. Conradie).

species, and the deep genetic divergence within this species complex (Adalsteinsson et al. 2009; Busschau et al. 2021) indicates the presence of a number of undescribed species that may have more restricted ranges and may be of significant conservation concern. *Other important names*: none.

Distribution: The species is endemic to South Africa, occurring in three subpopulations located in coastal northeastern KwaZulu-Natal province, central-eastern KwaZulu-Natal province and coastal and inland Eastern Cape province (Adalsteinsson et al. 2009; Broadley & Wallach 2009; Venter & Conradie 2015; Busschau et al. 2021). It may also occur in southern coastal Mozambique and eastern Lesotho, but it has not yet been recorded here. *EOO*: 93 000 km^2; *Distribution*: 22 200 km^2.

Country of occurrence: South Africa.

Habitat and ecology: Fossorial, the coastal Eastern Cape and KwaZulu-Natal populations are associated with forests, while the interior Eastern Cape populations are associated with Grassland. *Habitat*: Forest, Grassland.

Threats: Approximately 50% of the natural vegetation within the distribution has been lost due to agriculture and urbanisation and this has resulted in significant habitat fragmentation. Nevertheless, over large parts of the range, this species occurs in small forest patches that are naturally fragmented, although many of these patches appear to be contracting due to human activities. The inland subpopulation that occurs in the remaining Grassland patches may be disproportionally impacted by loss of Grassland habitat.

Population trend: It is likely that the population is undergoing local declines due to the significant habitat loss in some areas. In particular, the inland population is suspected to have declined with the shift of natural Grassland to agriculture.

Conservation and research recommendations: An assessment as to whether this species can tolerate some habitat transformation is urgently required to evaluate the impact of habitat fragmentation on the population. An investigation as to whether the isolated subpopulations are separate species is needed.

Family **Leptotyphlopidae**

Leptotyphlops telloi Broadley & Watson, 1976

Tello's Thread Snake

Regional near-endemic

NT – Near Threatened B1b(iii) (Global)

Assessors: Verburgt, L., Pietersen, D.W., Alexander, G.J., Farooq, H.

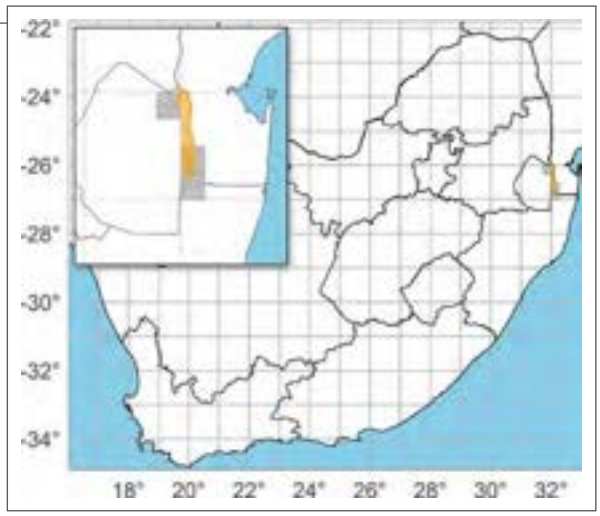
Previous Red List categories:
2020: Near Threatened (IUCN Global assessment).
2017: Near Threatened (IUCN Global assessment).

Assessment rationale: This species has a small distribution and there are few occurrence records. It is inferred to have declined due to a reduction in the extent and quality of habitat throughout its range.

Taxonomic notes: The taxonomic validity of this species is uncertain and its relationship to other populations in the *L. scutifrons–L. conjunctus* complex requires further study. *Other important names*: none.

Distribution: Endemic to the Lebombo Mountains, recorded close to the border between Eswatini and Mozambique (Broadley & Broadley 1999). Localities confirmed for Eswatini are Mambane and Umbuluzi Gorge (Boycott 1992a,b), and for Mozambique are Estatuane and Namaacha (Broadley & Broadley 1999). It has not been recorded from South Africa but may occur in KwaZulu-Natal and Mpumalanga provinces. All records of this species pre-date the early 1990s. *EOO*: 1 270 km²; *Distribution*: 1 080 km².

Countries of occurrence: Eswatini, Mozambique.



Habitat and ecology: A fossorial species that has been recorded from Savanna habitat in a mountainous area (Broadley & Broadley 1999) between 125 and 700 m a.s.l. *Habitat*: Savanna.

Threats: Threats include land transformation due to subsistence farming and rural settlements. Overgrazing by livestock and increased frequency of fire may further impact on habitat quality.

Population trend: There are no measures of abundance or trends, but there is significant habitat transformation in the range, and this snake has not been recorded since the early 1990s. Therefore, the population is inferred to have declined.

Conservation and research recommendations: An investigation into the taxonomic status of this species is required, as is an improved estimate of the distribution through the collection of additional records.

Leptotyphlops telloi, Namaacha, Mozambique (© Ditsong NSCF).

Leptotyphlops telloi, Namaacha, Mozambique (© Ditsong NSCF).

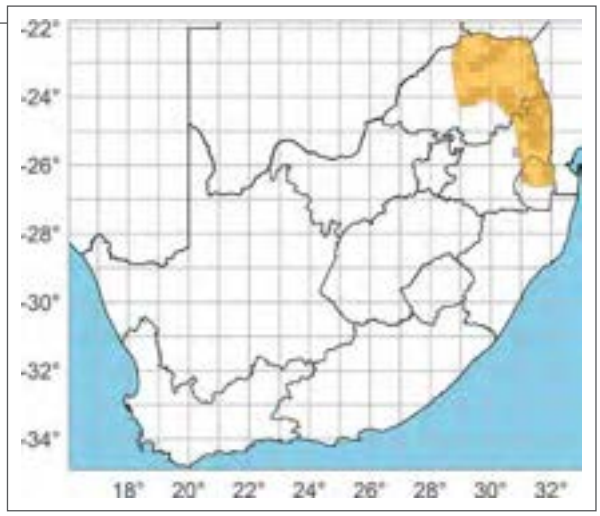
Family **Leptotyphlopidae**

Myriopholis longicauda (Peters, 1854)

Long-tailed Thread Snake

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: This species has a complicated taxonomic history but is now considered to occur only in southeastern Africa (Broadley & Wallach 2007). *Other important names*: *Leptotyphlops longicauda*.

Distribution: Distributed across much of the south-central areas of southern Africa. Regionally, it occurs in the extreme northeastern parts of South Africa and northern Eswatini (Broadley & Broadley 1999). *EOO*: 116 000 km^2; *Distribution*: 91 400 km^2.

Countries of occurrence: Botswana, Eswatini, Malawi, Mozambique, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Fossorial, occurring in a wide range of soils in mesic environments. Found under rocks on soil at elevations of 200–1 400 m a.s.l. (Jacobsen 1989). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Myriopholis longicauda, Venetia, Limpopo province (© M. Petford).

Family **Leptotyphlopidae**

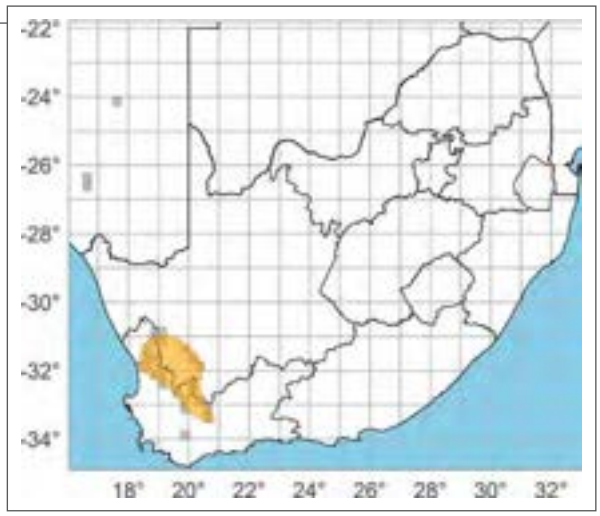
Namibiana gracilior (Boulenger, 1910)

Slender Thread Snake

Near-endemic

LC – Least Concern (Global)

Assessor: Alexander, G.J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: There is an isolated subpopulation in south-central Namibia, separated from the main distribution by about 500 km. *Other important names*: *Leptotyphlops gracilior*.

Distribution: Distributed in southwestern South Africa, with some widely scattered records in south-central Namibia (Broadley & Broadley 1999). *EOO*: 48 900 km^2; *Distribution*: 32 800 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Subterranean in habit and often inhabiting moribund termitaria (Branch 1998). *Habitat*: Shrubland.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the isolated Namibian subpopulation should be investigated.

Namibiana gracilior, Op-die-Berg, Western Cape province (© C. & S. Dorse).

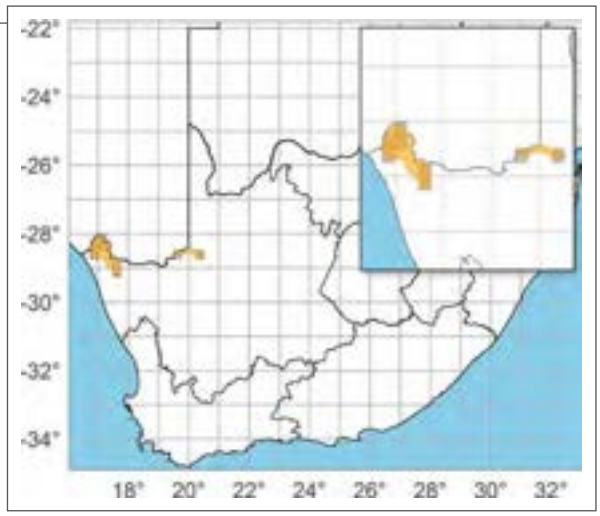
Family **Leptotyphlopidae**

Namibiana occidentalis (FitzSimons, 1962)

Western Thread Snake

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: *Leptotyphlops occidentalis*.

Distribution: Occurs across most of central and southern Namibia, just entering the Northern Cape province, South Africa (Broadley & Broadley 1999) with most records along or near the Orange River Valley. *EOO*: 29 100 km^2; *Distribution*: 7 010 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Fossorial and occurring in arid environments. *Habitat*: Desert, Shrubland.

Threats: There are no significant threats. The species is widespread in an area that has low human population densities and is generally too arid for intensive agriculture.

Population trend: In spite of the small geographic range of this species, it occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Namibiana occidentalis, Brandberg, Namibia (© C. & S. Dorse).

Family **Typhlophidae**

Afrotyphlops bibronii (Smith, 1846)

Bibron's Blind Snake

LC – Least Concern (Regional)

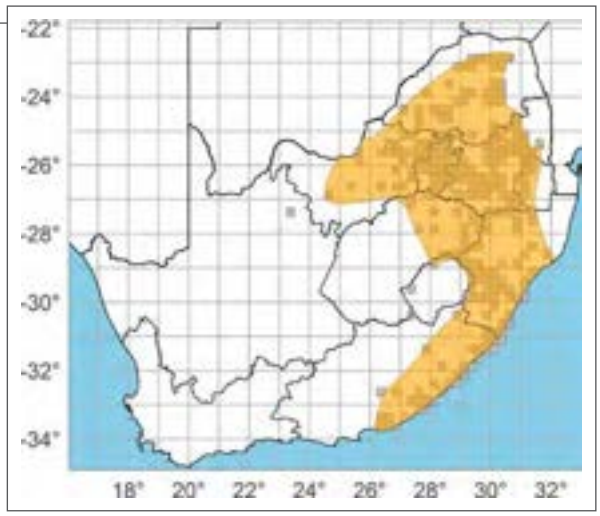
Assessor: Measey, J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: There is an isolated subpopulation in eastern Zimbabwe that could potentially represent a separate taxon. *Other important names*: *Typhlops bibronii*.

Distribution: This species is distributed across eastern and northern South Africa, extending into extreme southeastern Botswana (Broadley & Wallach 2009; Broadley & Blaylock 2013). It is unlikely to occur in southern Mozambique as had been previously thought (Broadley 1990b). There are several isolated records from southeastern Free State province and adjacent Lesotho. There is also an isolated subpopulation in eastern Zimbabwe (Nyanga and Chimanimani districts) and possibly in adjacent western Mozambique (Broadley 1990a; Broadley & Wallach 2009; Broadley & Blaylock 2013). *EOO*: 665 000 km²; *Distribution*: 398 000 km².



Afrotyphlops bibronii, East London, Eastern Cape province (© C. Keates).

Countries of occurrence: Botswana, Eswatini, Lesotho, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Burrows in loose soil, entering the upper strata, or appearing on the soil surface especially after rain in search of macro-invertebrate prey items (Broadley 1990a). Occurs in old termitaria and under rocks and rotting logs (De Waal 1978; Jacobsen 1989) at elevations from sea level to 2 000 m a.s.l. (Broadley & Wallach 2009). *Habitat*: Grassland, Savanna.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread species with large parts of the range that are not impacted by habitat transformation.

Conservation and research recommendations: The subpopulation in the Eastern Highlands of Zimbabwe requires a taxonomic assessment, and the occurrence of this species in Mozambique requires confirmation. Material from the contact areas, especially in the Lebombo Mountains, between this species and *A. fornasinii* should be checked for identification.

Afrotyphlops fornasinii (Bianconi, 1849)

Fornasini's Blind Snake

LC – Least Concern (Regional)

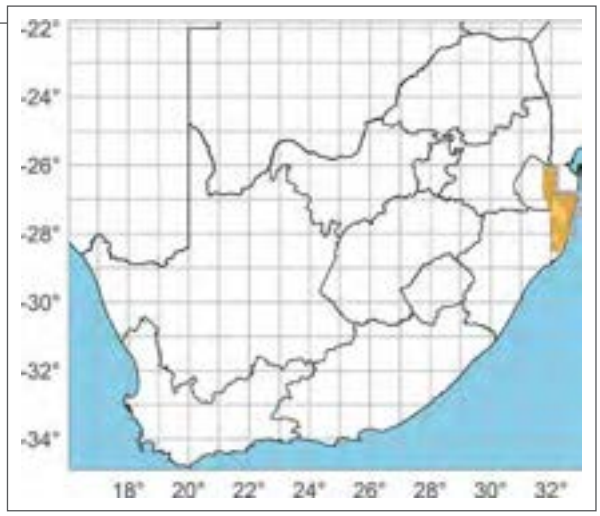
Assessor: Measey, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: Although the South African portion of the range is not large, the species is common and appears to be tolerant of moderate habitat change.

Taxonomic notes: The taxonomic status of the insular populations off the coast of Mozambique and the population in southeastern Zimbabwe are not known. *Other important names*: *Typhlops fornasinii*.

Distribution: Occurs from the coastal plains of northern South Africa, northwards into southern Mozambique, including the adjacent offshore islands. An apparently isolated population occurs in southeastern Zimbabwe (Broadley 1990b, 1990b; Branch 1998; Broadley & Wallach 2009). *EOO*: 20 180 km^2; *Distribution*: 15 300 km^2.



Afrotyphlops fornasinii, St Lucia, KwaZulu-Natal province (© J. Marais).

Countries of occurrence: Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Occurs in coastal sand associated with leaf litter (Branch 1998), at elevations lower than 100 m a.s.l. (Broadley & Wallach 2009). *Habitat*: Forest, Grassland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: Surveys of the intervening sections of the Mozambique plain would assist in assessing whether the population in southeastern Zimbabwe is truly disjunct.

Family **Typhlophidae**

Afrotyphlops mucruso (Peters, 1854)

Zambezi Giant Blind Snake

LC – Least Concern (Regional)

Assessor: Measey, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern as *Megatyphlops mucruso* (Regional assessment).

Assessment rationale: Although not often seen, this species is common and has a moderately large range in South Africa with no major threats.

Taxonomic notes: Recently Trape & Collet (2021) suggested reviving *Afrotyphlops dinga* for *A. mucruso*, but that is not yet widely accepted. *Other important names*: *Rhinotyphlops schlegelii mucruso*; *Megatyphlops mucruso*.

Distribution: Widespread across southern Africa, extending into central Africa, East Africa and Angola (Broadley 1990a; Broadley & Wallach 2009). In South Africa, it is restricted to extreme northern Limpopo province, north of the Soutpansberg, with a single isolated record in the central Kruger National Park (Broadley & Wallach 2009). *EOO*: 33 000 km²; *Distribution*: 15 000 km².

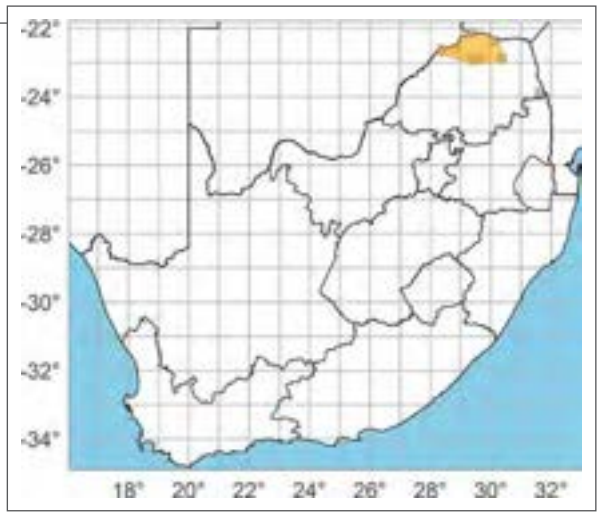
Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Kenya, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: A fossorial species that occurs in relatively hard substrates, at elevations from sea level to 1 740 m a.s.l. (Broadley & Wallach 2009). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: In spite of the small geographic range of this species regionally, it occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.



Afrotyphlops mucruso, Waterpoort, Limpopo province (© R.I. Stander).

Afrotyphlops mucruso, Inhassoro, Mozambique (© L. Verburgt).

Afrotyphlops schlegelii (Bianconi, 1849)

Schlegel's Giant Blind Snake

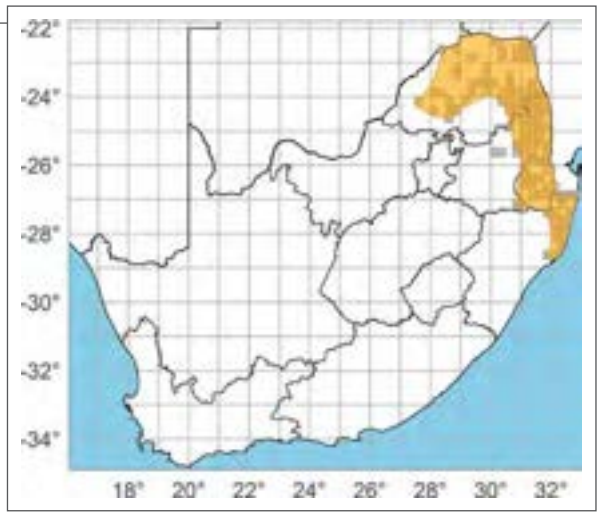
LC – Least Concern (Regional)

Assessor: Measey, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern as *Megatyphlops schlegelii* (Regional assessment).

Assessment rationale: Widespread and common with no significant threats.

Taxonomic notes: With the revision of the African Typhlopidae, *A. schlegelii petersii* was considered a junior synonym of *A. schlegelii* (Broadley & Wallach 2009). This has not been tested in a phylogenetic framework and needs further work. *Other important names*: *Rhinotyphlops schlegelii schlegelii*; *Rhinotyphlops schlegelii petersii*; *Megatyphlops schlegelii*.



Distribution: Occurs in the northeastern regions of South Africa, from KwaZulu-Natal province northwards into much of central and western southern Africa (Broadley & Wallach 2009). Although this species has been mapped into North West province,

Afrotyphlops schlegelii, Hoedspruit, Limpopo province (© D.W. Pietersen).

Family **Typhlophidae**

Afrotyphlops schlegelii, Hoedspruit, Limpopo province (© D.W. Pietersen).

Afrotyphlops schlegelii, Hoedspruit, Limpopo province (© D.W. Pietersen).

South Africa (https://vmus.adu.org.za/), this refers to a record from Botswana (Auerbach 1987). *EOO*: 218 290 km^2; *Distribution*: 133 170 km^2.

Countries of occurrence: Angola, Botswana, Eswatini, Mozambique, Namibia, South Africa.

Habitat and ecology: A fossorial species that is most often observed when crossing roads after rain. It occurs at an elevational range from sea level to 1 200 m a.s.l. (Jacobsen 1989; Bourquin 2004). *Habitat*: Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and fairly common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the synonym *A. s. petersii* should be evaluated in a phylogenetic framework.

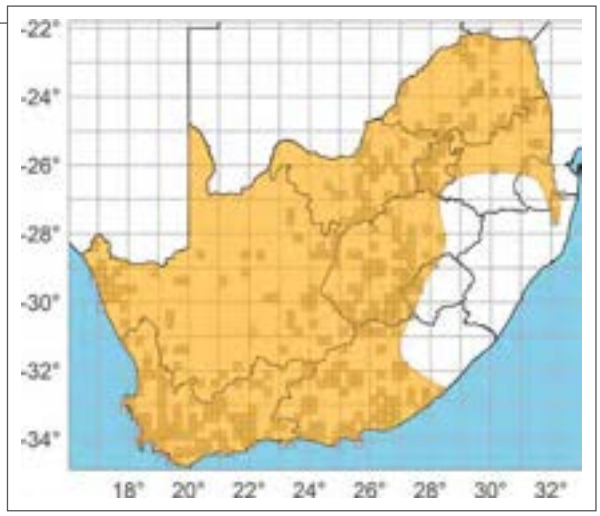
Family **Typhlophidae**

Rhinotyphlops lalandei (Schlegel, 1839)

Delalande's Beaked Blind Snake

LC – Least Concern (Regional)

Assessor: Measey, J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: This species is widespread and common with no known substantial threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Widespread across southern Africa from Mozambique westwards through South Africa to Namibia (Broadley & Wallach 2009; Pietersen et al. 2013). It is widespread regionally, although absent from KwaZulu-Natal province (east of the Drakensberg). *EOO*: 1 517 000 km²; *Distribution*: 1 048 000 km².

Countries of occurrence: Botswana, Eswatini, Lesotho, Mozambique, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Fossorial, also occurring under rocks and rotting logs, and in moribund termitaria from near sea level to just over 1 400 m a.s.l. (De Waal 1978; Jacobsen 1989; Broadley & Wallach 2009). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Rhinotyphlops lalandei, Beaufort West, Western Cape province (© L. Verburgt).

Family **Typhlophidae**

Rhinotyphlops schinzi (Boettger, 1887)

Schinz's Beaked Blind Snake

LC – Least Concern (Regional)

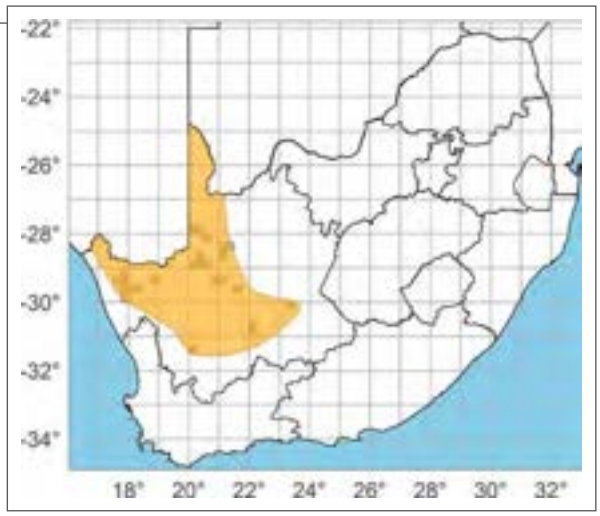
Assessor: Measey, J.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: Widespread, occurring in areas with relatively little habitat transformation.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Distributed in the more arid western regions of southern Africa (Broadley & Wallach 2009). Within South Africa, it occurs only in the Northern Cape province from the central Karoo, northwards to the Kalahari and into Namaqualand. *EOO*: 288 000 km^2; *Distribution*: 169 000 km^2.



Rhinotyphlops schinzi, Askham, Northern Cape province (© C. & S. Dorse).

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: The beak of this snake suggests that it is capable of burrowing into hard ground in the arid zones that it inhabits. *Habitat*: Desert, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Because this snake occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

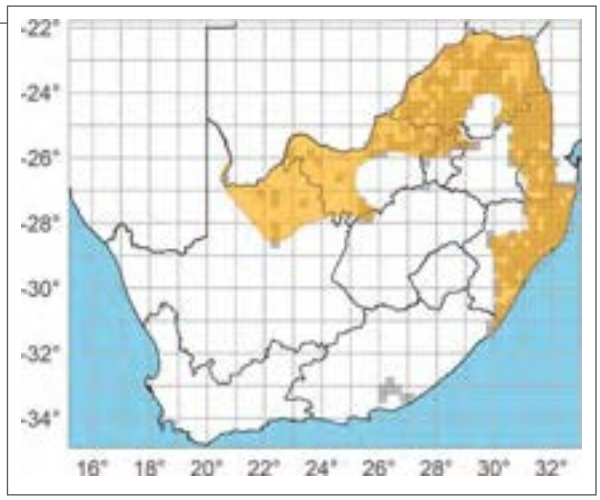
Conservation and research recommendations: No recommendations.

Python natalensis Smith, 1840

Southern African Python

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although the species is widespread, its status as an apex predator and large body size make it especially sensitive to habitat transformation and fragmentation. This has resulted in declines and local extinctions of several populations (FitzSimons 1962; Alexander 1990), with a reduction in the EOO, but this is not extensive enough for the species to be classified as threatened.

Taxonomic notes: *Python sebae natalensis* was elevated to full species by Broadley (1999) based on morphological characters and colour pattern. A phylogenetic analysis (K.A. Tolley and G.J. Alexander, unpubl. data 2020) supports the treatment of *P. natalensis* and *P. sebae* as full species. *Other important names*: none.

Distribution: Africa, from the equator south to the northern and eastern parts of South Africa, including the northeastern parts of the Northern Cape province, and Eswatini (Alexander 2007). In the west, the northern limit is south of the Kwanza River in central Angola, but it extends further north in the east at higher elevations in the eastern and western arcs of the Rift Valley (Broadley 1999). In South Africa it extends as far as the Kalahari region in the Northern Cape province and south to Mkambati in the Eastern Cape province. A seemingly extinct subpopulation in the Eastern Cape province is spatially separated from the main distribution by more than 350 km. There are no recent records from this subpopulation, with

Python natalensis, Simunye, Eswateni (© J. Marais).

Family **Pythonidae**

Python natalensis, near St Lucia, KwaZulu-Natal province (© T. Ping).

the last documented occurrence from near Alicedale in 1994. In the western parts of the South African range, several new records have extended the southern range edge. Several peripheral sight records in KwaZulu-Natal and Mpumalanga provinces (see Alexander 2014) have not been verified in many years and have thus been excluded from the distribution map. *EOO*: 773 000 km^2; *Distribution*: 345 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a wide variety of habitats, but usually in riverine or rocky areas, and often in association with large animal burrows, which appear to form a critical microhabitat for reproduction (Alexander 2018). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: The large body size attained by adults means that population densities are likely to be relatively low, but that individuals are often highly visible. Habitat transformation has caused the extinction of some populations (Alexander 1990), electrocution on game fencing represents a growing threat (Beck 2009), and there has been wanton killing as these snakes are perceived to be a threat to livestock (Branch 1988). *Use and trade*: Although protected by its listing on the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004): List of Terrestrial and Fresh Water Species (ToPS List) in South Africa, there is illegal harvesting for traditional medicine (*muthi*), meat (Williams et al. 2016), fashion and pet trade (Broadley 1983; Branch 1988).

Population trend: Although subpopulations in the Eastern Cape province and parts of KwaZulu-Natal province of South Africa are considered to have become locally extinct, there is evidence of recent southward range expansions in North West, Gauteng and KwaZulu-Natal provinces (G.J. Alexander, pers. obs. 2018) and the Northern Cape province. Although Alexander (1990) reported that the species had become rare in Durban, recent observations suggest a reversal in this trend.

Conservation and research recommendations: Quantify the unregulated traditional medicine trade in this species.

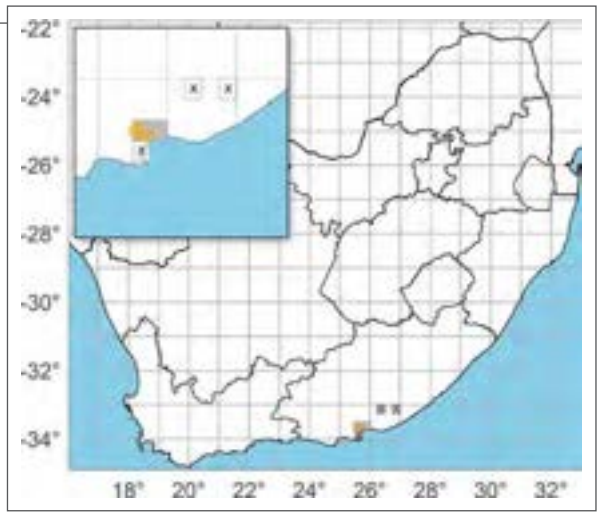
Bitis albanica Hewitt, 1937

Albany Adder

South African endemic

EN – Endangered B1ab(i,iii,iv,v) (Global)

Assessors: Tolley, K.A., Alexander, G.J., Weeber, J., Conradie, W., Pietersen, D.W. Maritz, B., Turner, A.A.



Previous Red List categories:
2018: Endangered (Global IUCN assessment).
2017: Critically Endangered (Global IUCN assessment).
2014: Critically Endangered (Regional assessment).

Reason for recent change: Non-genuine.

Assessment rationale: There has been a significant decline in the extent of habitat and a reduction in EOO due to urbanisation and these threats are ongoing. There have been no recent observations from historical parts of the distribution at Gqeberha (Die Duine) and Makhanda (Brak Kloof and Kleinpoort, Makhanda) for about 100 years, despite directed searches, so those subpopulations are suspected to have declined to extinction causing the large decline in EOO, and possibly loss of subpopulations. Most of the remaining distribution occurs as a single population, however the extent of the distribution has been inferred by species distribution modelling and is uncertain due to few records having been collected. Nevertheless, it is highly unlikely that this snake occurs only where the few records have been made because probability of detection is considered low, and it is therefore suspected that it occurs more widely. For example, targeted surveys since 2016 have resulted in dozens of new records overall, with several new records from Addo Elephant National Park and these have been incorporated into species distribution modelling. This

Bitis albanica, Coega, Eastern Cape province (© Bionerds).

Family **Viperidae**

Bitis albanica, Coega, Eastern Cape province (© C. Keates).

Bitis albanica, Coega, Eastern Cape province (© G.K. Nicolau).

has contributed to an increase in the EOO estimate. A small portion of the inferred range is within an active mining area (where several recent observation records have been made), but there is a plausible threat of an increased mining footprint as well as an expanding wind farm footprint with a concomitant increase in infrastructure. This snake is therefore suspected to be at five to six locations, defined by threats of existing mining and wind farms, plus expanding mining and expanding wind farming, as well as development of infrastructure in the south of the range, with the Addo Elephant National Park area also forming a location. This species was previously assessed as Critically Endangered in 2017 on the basis of being in only one threat location and an EOO of 95 km^2. However, reanalysis of the distribution and new data suggests there is no credible threat that could result in just one threat-defined location, and it has been reassessed on having five threat-defined locations based on the impact of land transformation due to mining and windfarms. In addition, the new records from Addo Elephant National Park extends the range and increases the EOO substantially. Therefore, the species no longer qualifies as Critically Endangered given that the larger EOO lowers the extinction risk.

Taxonomic notes: Recent phylogenetic analyses suggest that *B. albanica*, *B. armata*, *B. inornata* and *B. rubida* form a closely related species complex (Barlow et al. 2019) and the relationships between these taxa are worthy of further investigation. *Other important names*: none.

Distribution: *Bitis albanica* is restricted to inland areas of the Algoa Bay region in the Eastern Cape province, South Africa (Branch 1998). It appears to have become locally extinct from several historical localities near Gqeberha and Makhanda, where it has not been recorded for more than 100 years. However, it is inferred to occur throughout the Coega Bonteveld vegetation and has recently been recorded from Thicket vegetation in the Addo Elephant National Park. Species distribution modelling has been used to guide the current interpretation of the distribution and together with the new record, the estimate of EOO has been increased. *EOO*: 699 km^2; *Distribution*: 581 km^2.

Country of occurrence: South Africa.

Habitat and ecology: In recent years, this snake has been recorded from Sundays Thicket and Coega Bontveld vegetation types, which fall within limestone and calcareous paleo-dune substrates. The locally extinct subpopulations occurred in other vegetation types (strandveld, Fynbos), suggesting that the species was not originally restricted to one or two vegetation types. Historically, this snake ranged in elevation from sea level to 400 m a.s.l. *Habitat*: Shrubland.

Threats: Habitat transformation associated with strip mining is the main threat at present, although large parts of the historical distribution were most certainly impacted by urbanisation given the loss of subpopulations in urbanised areas. Currently, the remaining natural habitat within the modern-day

range is about 95% intact. However, the potential expansion of limestone strip mining and wind farming poses a threat that would likely result in a further population decline for *B. albanica*. There is a possible future threat of development due to expansion related to the Coega Industrial Development Zone (https://www.coega.co.za/), which is a special economic zone (SEZ) set for development of industry. The current demarcated area of this SEZ overlaps marginally with the southern portion of the inferred range of *B. albanica*. Although there are no obvious indications at present, any northward expansion of this SEZ could potentially pose a further threat. *Use and trade*: There is no known legal pet trade of wild individuals, although anecdotal observations suggest that removals for the pet trade is an emerging threat (K. Lynch, pers. obs. 2020). The presence of this species in the pet trade should be monitored, as removal of individuals from the wild could be significant given that the population size is suspected to be very small.

Population trend: The global population is likely to be small, as relatively few individuals have ever been recorded. Recent targeted surveys have produced additional records, although most records are still from a small part of the inferred distribution (B. Maritz, unpubl. data 2017; A. Lynch, unpubl. data 2020). Despite this, a recent concerted effort to record this species from within Addo Elephant National Park has produced several new records suggesting there is a viable population within this protected area. Nevertheless, much of the inferred distribution is from outside the protected area and the overall population trend is suspected to be declining based on local extinctions of historical subpopulations, the slow accumulation of new occurrence records of the species, and because there is an ongoing reduction in available habitat.

Conservation and research recommendations: The taxonomic status of this species should be investigated considering the close relationship with other dwarf *Bitis* species (Barlow et al. 2019). Surveys of the Coega Bontveld habitat, including in Addo Elephant National Park, and research to improve knowledge of abundance and habitat preferences of this species would allow for better estimation of distribution and possibly of connectivity between subpopulations. To date, there are few records of this snake, but this may be because it is a small, cryptic species rather than because of low abundance. Better knowledge on the activity period, ecology and habitat preferences of this snake is needed to improve the probability of detection as well as the most effective survey method for this species. Mark–recapture surveys would allow for density and survival estimates. Museum specimens could easily be referred to for improving biological information that would help to clarify whether there is seasonal activity, mate searching or other factors that may impact the detection probability, and inferences along these lines could be made from similar information on congeners that are more plentiful in museum collections. Some means of formal protection needs be conferred for the areas that are under threat of mining and other infrastructure development, and an investigation of potential illegal collection of individuals from the wild for the commercial pet trade should be made. This snake is a candidate for a Biodiversity Management Plan for the Species (BMP, see the South African National Environmental Management: Biodiversity Act, Act No. 10 of 2004) that is informed, in part, by a Population and Habitat Viability Analysis.

Family **Viperidae**

Bitis arietans (Merrem, 1820)

Puff Adder

LC – Least Concern (Regional)

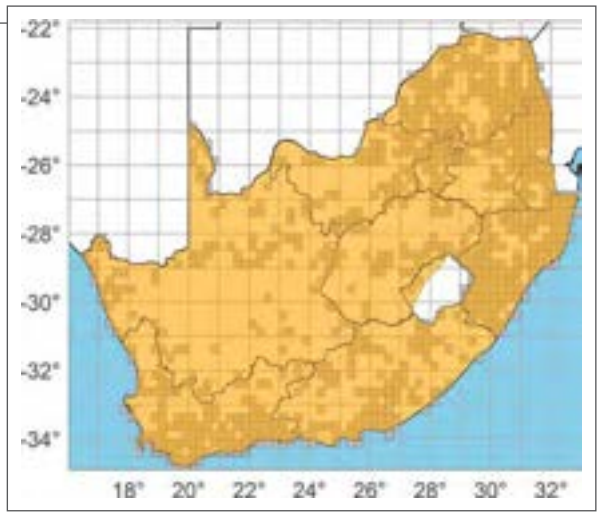
Assessors: Maritz, B., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Bitis arietans arietans* – Least Concern (Regional assessment).

Assessment rationale: Widespread and abundant across the region with no significant threats.

Taxonomic notes: Although there is some clear genetic diversity within this widespread species, the clades that occur across sub-Saharan Africa do not represent cryptic species (Barlow et al. 2013). The northern and central Africa clades are, however, reasonably divergent from the southern African clade (Barlow et al. 2013) and this merits further investigation. *Other important names*: none.



Distribution: Occurs throughout most of sub-Saharan Africa and extends to the Arabian Peninsula, with an apparently isolated population in northwestern Africa (Broadley 1990a; Spawls & Branch 2020). Very widespread in South Africa, Lesotho and Eswatini. *EOO*: 1 560 000 km^2; *Distribution*: 1 244 000 km^2.

Bitis arietans, Makhanda, Eastern Cape province (© C. Keates).

Bitis arietans, Hluhluwe, KwaZulu-Natal province (© T. Ping).

Bitis arietans, Hluhluwe, KwaZulu-Natal province (© T. Ping).

Countries of occurrence: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Eritrea, Eswatini, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Oman, Republic of the Congo, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Somalia, South Africa, Tanzania, Togo, Uganda, Western Sahara, Yemen, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a wide variety of habitats but absent from very high elevations, dense forests and true deserts (Branch 1998). Although it is a habitat generalist, population densities vary throughout its range, and it appears to be most abundant in areas of bushy cover (Phelps 2010). *Habitat*: Grassland, Savanna, Shrubland.

Threats: Known from the traditional medicine trade in South Africa (Whiting et al. 2011; Williams et al. 2016). It is used elsewhere across its range for food and traditional medicine.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs across large areas that are not significantly impacted by habitat transformation.

Conservation and research recommendations: Further phylogenetic and taxonomic work could assist to assess the divergence between the southern African clade and the north/central clade.

Family **Viperidae**

Bitis armata (Smith, 1826)

Southern Adder

South African endemic

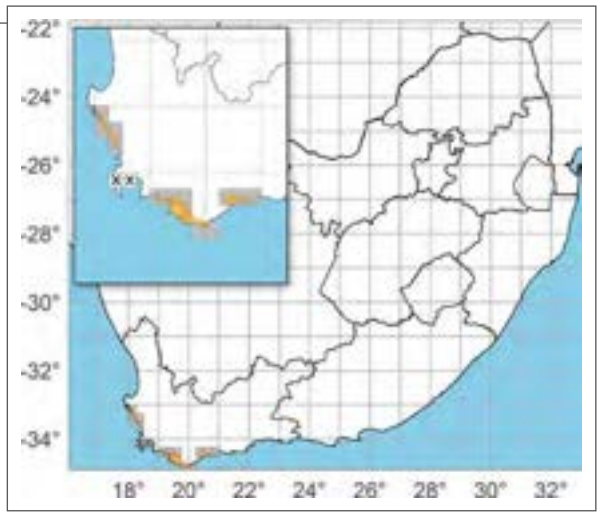
VU – Vulnerable B1ab(i,iii,iv,v) (Global)

Assessors: Maritz, B., Turner, A.A.

Previous Red List categories:
2018: Vulnerable (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (Regional assessment).

Assessment rationale: This species has a severely fragmented distribution and there has been a reduction in the extent and quality of habitat, with a corresponding decline in EOO. *Bitis armata* is restricted to coastal Fynbos associated with limestone, which, outside of protected areas, is threatened by urbanisation and agriculture. It has become locally extinct from the Cape Town region presumably due to urbanisation, causing a reduction in EOO.

Taxonomic notes: A recent phylogenetic study suggests that *B. albanica*, *B. armata*, *B. inornata* and *B. rubida* form a closely related species complex (Barlow et al. 2019) and the relationships between these taxa is worthy of further investigation. In addition, the taxonomic status of an isolated subpopulation near Langebaan should be investigated. *Other important names*: none.



Distribution: This species has a small distribution in the southwest coastal margin of the Western Cape province, South Africa, as three disjunct subpopulations with a fourth subpopulation from the Cape Town area having become locally extinct, causing a decline in the EOO. The northern subpopulation occurs from the West Coast National Park to about

Bitis armata, Struisbaai, Western Cape province (© C. & S. Dorse).

20 km north of Cape Town. The southeastern subpopulations occur near Hermanus and in the proximity of De Hoop Nature Reserve on the Cape south coast. *EOO*: 17 770 km²; *Distribution*: 2 140 km².

Country of occurrence: South Africa.

Habitat and ecology: Occurs mainly in coastal lowland Fynbos on sandy and rocky substrates, sometimes climbing into vegetation (Phelps 2010). Is known to shelter under rock slabs between dense shrubs on coastal plains (Branch 1998; Phelps 2010). It occurs from sea level to 300 m a.s.l. and does not occur in mountainous habitats. *Habitat*: Shrubland.

Threats: Primarily threatened by urbanisation and agriculture, which has resulted in habitat loss and population declines. In many areas, the habitat is also affected by invasive alien trees, which alter the habitat structure and diversity of indigenous vegetation, and probably have a negative impact. *Use and trade*: Known to be in the pet trade with some evidence of illegal collection (A. Turner, pers. comm. 2018). It is not known how many individuals are sourced from the wild or from captive stock.

Population trend: The population is suspected to be in decline. There have been no records from the ± 2 500 km² Cape Town metropolitan area for approximately 40 years and this subpopulation is considered locally extinct as a result of the intense land use in this region. Most of the lowland habitat around Cape Town has been lost to urbanisation and agriculture. Because of habitat fragmentation, more than half the individuals are thought to occur as severely fragmented, isolated subpopulations that are not connected through migration, and it is thought that these subpopulations are declining.

Conservation and research recommendations: Despite some subpopulations being well protected in certain areas (Tolley et al. 2019a), several subpopulations fall outside of protected areas and the lack of habitat corridors between subpopulations could impact metapopulation dynamics. Better survey data outside protected areas would be useful to assess whether subpopulations are in decline and becoming more fragmented. Given the loss of the Cape Town subpopulation and coastal habitat, surveys for presence in areas that may be incorporated into conservation networks are recommended.

Family **Viperidae**

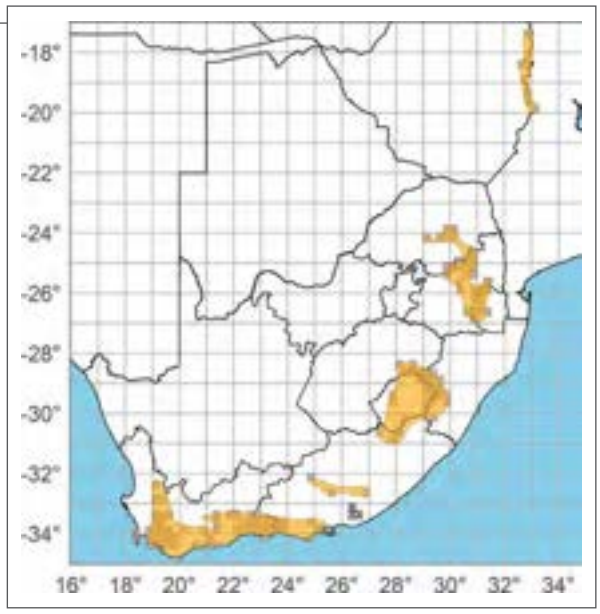
Bitis atropos (Linnaeus, 1758)

Berg Adder

LC – Least Concern (Global)

South African near-endemic

Assessors: Maritz, B., Turner, A.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: This species is widespread, occurring in several protected areas and in mountainous areas with little anthropogenic influences or habitat loss. However, there have been historical extinctions of some subpopulations due to habitat loss.

Taxonomic notes: Several discrete subpopulations occur along the southern African escarpment. Phylogenetic analysis correlates with morphological differences between these isolated populations, suggesting that between three and six cryptic taxa are subsumed under this name (C. Kelly, unpubl. data 2015). *Other important names*: *Bitis atropos unicolor*.

Distribution: Typically occurs in mountainous areas in association with the Cape Fold Mountains and coastal plains, the Drakensberg escarpment, and other mountain regions in South Africa, Lesotho and Eswatini. There is also an isolated subpopulation 500 km to the north in the Eastern Highlands of Zimbabwe and Mozambique (Broadley 1990; Branch 1998b). Because this snake mainly occurs in montane regions, there are large distribution gaps forming a number of isolated subpopulations. In South Africa, the species has recently been recorded from the

Bitis atropos, Cape St Francis, Eastern Cape province (© C. Keates).

Bitis atropos, Buffelskloof Private Nature Reserve, Mpumalanga province (© A. Jordaan).

Bitis atropos, Grabouw, Western Cape province (© C. & S. Dorse).

Amathole Mountains and coastal Cape St Francis. New records from the Sneeuberge of the Eastern Cape province, where it was historically recorded at Swaershoek, confirm its presence in that area. It has not been recorded in more than 50 years from the highly transformed areas of Gqeberha, Makhanda or East London in the Eastern Cape province. *EOO*: 1 088 100 km^2; *Distribution*: 140 450 km^2.

Countries of occurrence: Eswatini, Lesotho, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Occupies grass- or Fynbos-covered mountain slopes and summits, taking refuge under rock slabs and grass tussocks (Jacobsen 1989; Jordaan et al. 2021). Occurs from sea level (southern populations) to elevations of 3 000 m a.s.l. *Habitat*: Grassland, Shrubland.

Threats: The species appears to be affected by urbanisation, as well as high intensity grazing and frequent fires in parts of its range. *Use and trade*: This species is present in the pet trade as evidenced by numerous

Bitis atropos, Graskop, Mpumalanga province (© C.R. Hundermark).

Family **Viperidae**

Bitis atropos, Stylkop, Limpopo province (© K. Tolley).

Bitis atropos, Buffelskloof Nature Reserve, Mpumalanga province (© L. Verburgt).

online photos and videos of captive specimens. There is some evidence that animals have been illegally collected from Mpumalanga, Limpopo and Western Cape provinces (A. Turner, pers. comm. 2018) and this could negatively impact subpopulations.

Population trend: Although this species is widespread and considered common in parts of its range, it has undergone a historical decline and has become locally extinct in some areas (e.g., East London, Makhanda, Gqeberha). Regardless, it is not likely that this decline poses a significant risk to the entire population.

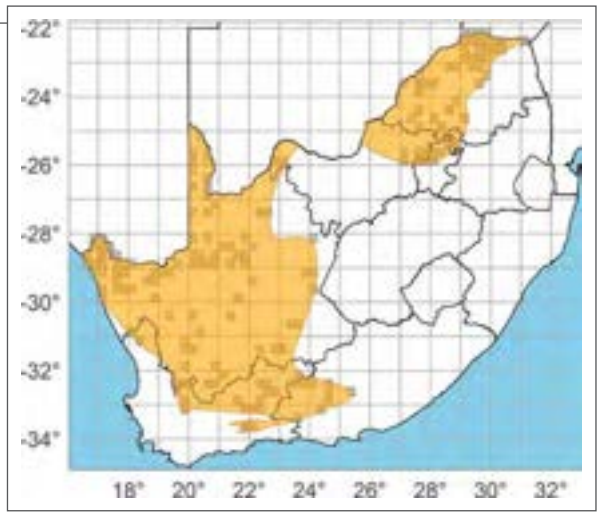
Conservation and research recommendations: The numbers and origins of individuals in the pet trade should be monitored to assess what impact illegal harvesting is having on the wild population. The taxonomic status of the isolated subpopulations requires investigation in a phylogenetic framework.

Bitis caudalis (Smith, 1839)

Horned Adder

LC – Least Concern (Regional)

Assessors: Maritz, B., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: Widely distributed and common in suitable habitat, with no substantial threats.

Taxonomic notes: A phylogenetic analysis shows that this species consists of at least two separate clades that are distinct at the species level (Barlow et al. 2019). A southern clade (primarily found in South Africa) is closely related to *B. schneideri*, whereas a northern clade (primarily found in Namibia) is most closely related to *B. peringueyi*. Populations from Botswana and Zimbabwe have not yet been assigned to either of these clades. *Other important names*: none.

Distribution: Widespread in the eastern and central regions of southern Africa, from southern Angola south to South Africa and east to eastern Zimbabwe. In South Africa, the distribution is mainly in the western arid regions and in the northeast (Branch 1998; Broadley 1990a; Alexander & Marais 2007). *EOO*: 1 042 000 km^2; *Distribution*: 489 000 km^2.

Countries of occurrence: Angola, Botswana, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Occurs in hot, dry, open areas at elevations of 300–1 600 m a.s.l. (Jacobsen 1989). May bury itself in sand with only the top of the head exposed, but also seeks refuge under rocks and vegetation. *Habitat*: Desert, Grassland, Savanna, Shrubland.

Bitis caudalis, Williston, Northern Cape province (© C.R. Hundermark).

Bitis caudalis, Gobabeb, Namibia (© G. Alexander).

Family **Viperidae**

Bitis caudalis, Mapungubwe, Limpopo province (© G. Alexander).

Bitis caudalis, Beaufort West, Western Cape province (© L. Verburgt).

Threats: This species is popular in the pet trade (advertised on Facebook and other online platforms) and appears to be harvested from the wild.

Population trend: The population size is not thought to have declined significantly because this snake occurs mainly in arid regions that have not been significantly impacted by habitat transformation, and the trade in wild-caught individuals appears to be fairly limited.

Conservation and research recommendations: The taxonomic status of the distinct clades requires further investigation in a phylogenetic framework with comprehensive sampling across the range of the clades. The level of harvesting for the pet trade should be assessed.

Bitis cornuta (Daudin, 1803)

Many-horned Adder

LC – Least Concern (Regional)

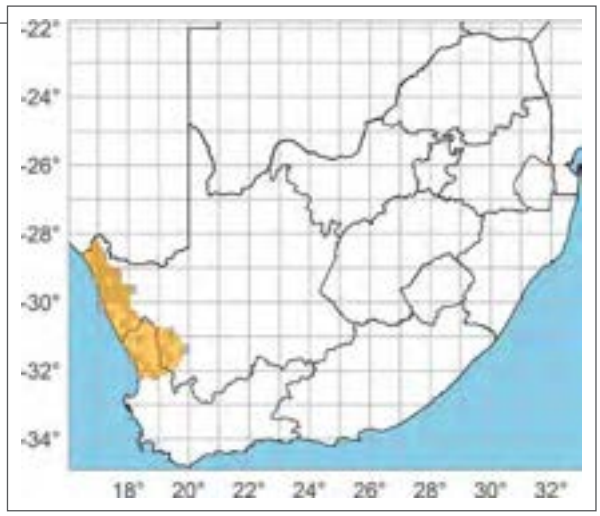
Assessors: Maritz, B., Turner. A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: Widespread, occurring in areas that are not impacted by habitat transformation.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs from central Namibia southwards along the west coast into South Africa. In South Africa, it is distributed along the western margin reaching marginally into the Western Cape province. *EOO*: 60 000 km²; *Distribution*: 46 700 km².



Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs mainly in dry to very dry rocky habitat and gravel plains with low shrub vegetation. Syntopic with *B. rubida* and *B. atropos* in the Cederberg range (Phelps 2010) and with *B. schneideri* in coastal Namaqualand (G.J. Alexander & B. Maritz, pers. obs. 2007). *Habitat*: Desert, Shrubland.

Threats: This species is popular in the pet trade (advertised on Facebook and other online platforms) and individuals appear to be harvested from the wild. It is not known whether this is a significant threat.

Population trend: Because this snake occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly. Collection from the wild for the pet trade is also believed to be fairly limited at present.

Conservation and research recommendations: The level of harvesting for the pet trade should be assessed.

Bitis cornuta, Noup, Northern Cape province (© W.R. Branch).

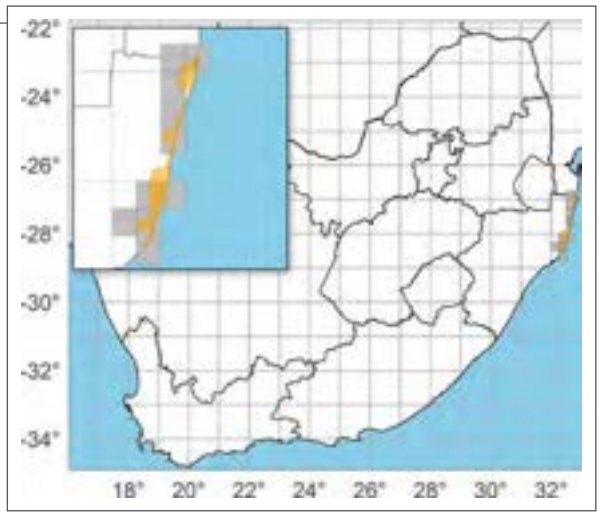
Family **Viperidae**

Bitis gabonica (Duméril, Bibron & Duméril, 1854)

Gaboon Viper

NT – Near Threatened B1b(i,iii,v)+B2b(ii,iii,v) (Regional)

Assessors: Alexander, G.J., Tolley, K.A., Weeber, J., Conradie, W., Pietersen, D.W., Maritz, B., Turner, A.A., Burger, M.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Near Threatened (Regional assessment).

Assessment rationale: This species has a relatively small distribution in South Africa, but much of the habitat has been transformed and it is unlikely to persist in those areas. The EOO and AOO have declined from their historical values, and both fall below the threshold for Endangered under criterion B. However, the range is not severely fragmented, and there are many threat-defined locations. About 70% of the South African range falls within the iSimangaliso Wetland Park and World Heritage Site, and rates of decline in quality and extent of habitat overall have slowed since 1990. Nevertheless, there is an emerging threat of socioeconomically driven land invasion into the protected area by local communities, and this should be monitored. If this threat becomes active and given the relatively small EOO, most of which falls within the protected area, this species could rapidly become threatened. This snake is sedentary, and it is unlikely that there is significant immigration between regions. Therefore, the regional status was not amended to take the global population into account.

Bitis gabonica, Coutada, Mozambique (© G.K. Nicolau).

Taxonomic notes: A phylogenetic study shows that the geographically disjunct South African subpopulation is not divergent from subpopulations to the north (Barlow et al. 2019) and is also morphologically similar to the closest subpopulation in Zimbabwe/Mozambique (Broadley 1990a). *Other important names*: none.

Distribution: Occurs across much of sub-Saharan Africa and is widespread across central Africa from Zambia to Nigeria (Phelps 2010; Chippaux & Jackson 2019). There appear to be four allopatric subpopulations (Phelps 2010). The subpopulation in South Africa occurs in northeastern KwaZulu-Natal province, and is geographically isolated, with the nearest subpopulation in the forests of the eastern escarpment of Zimbabwe and Mozambique (Broadley 1990a; Phelps 2010). The disjunct subpopulations might have become recently fragmented, given that the South African subpopulation is not genetically divergent from those in central Africa (Barlow et al. 2019). The most southern EOO at Mtunzini in KwaZulu-Natal province seems to be the result of translocated individuals outside the natural range and is therefore excluded from the EOO. *EOO*: 3 660 km^2; *AOO*: 2 480 km^2; *Distribution*: 1 900 km^2.

Countries of occurrence: Angola, Cameroon, Central African Republic, Democratic Republic of the Congo, Gabon, Kenya, Malawi, Mozambique, Nigeria, Republic of the Congo, Rwanda, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: In South Africa, this species occurs in subtropical, northeastern coastal plains where it occupies moist Coastal Forests and surrounding moist Grasslands and Savanna. It has been recorded from the ecotone between forests and Grassland/Savanna (Perrin & Bodbijl 2001; Alexander & Marais 2007; Phelps 2010). The South African population is distributed mainly in coastal dune forest (Warner 2009), which occurs in a 10–20 km wide strip along the coastline. *Habitat*: Forest, Grassland, Savanna.

Threats: This species is largely dependent on forests, which are degraded outside of the iSimangaliso Wetland Park. The majority of the South African range falls within this protected area, but despite the official protection status, the park has become vulnerable to the threat of socioeconomically driven land invasion by local communities. Given that other protected areas in South Africa recently have been de-gazetted due to land invasions in favour of informal human settlement (e.g., Western Cape Government 2022), this is a plausible emerging threat. Additional threats include road mortality and wanton killing. It may be threatened in the future by mining of the mineral-rich sands that dominate this habitat. *Use and trade*: This snake is collected from the wild for the pet and *muthi* (traditional medicine) trade (Williams et al. 2016). There are no estimates on the number of individuals collected from the wild.

Bitis gabonica, St Lucia, KwaZulu-Natal province (© T. Ping).

Population trend: The South African subpopulation has been estimated to range from 500 individuals (Bodbijl 1994) to between 1 900 and 3 500 individuals (Warner 2009). This might be a long-lived species with low recruitment and is probably not abundant, the collection of adults from the wild might have a negative impact on the population. Although at least half the population is in a large, protected area, because the removals from the wild are not quantified, it is unknown whether the population is stable or declining. However, given that most of the habitat loss occurred more than 30 years ago (e.g., possibly three generations), it is unlikely that there has been a significant recent population decline.

Conservation and research recommendations: Tracking population trends and measures of abundance both inside and outside of the iSimangaliso Wetland Park would be useful. In addition, there is an emerging threat of socioeconomically driven land invasion by local communities within protected areas where this species primarily occurs. Changes in land use and potential rapid habitat destruction will require careful monitoring.

Family **Viperidae**

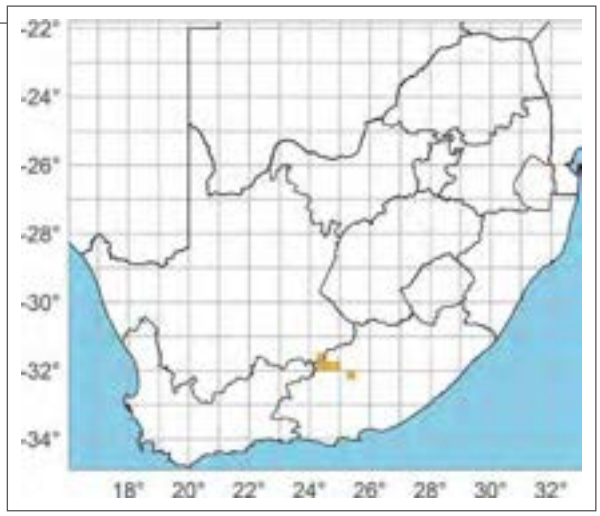
Bitis inornata (Smith, 1838)

Plain Mountain Adder

South African endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Tolley, K.A., Alexander, G.J., Weeber, J., Pietersen, D.W., Maritz, B., Turner, A.A.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).
2017: Endangered (Global IUCN assessment).
2014: Endangered (Regional assessment).
1996: Vulnerable (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine.

Assessment rationale: This species is endemic to South Africa and has been recorded from just two areas, approximately 130 km apart in the Eastern Cape province. One subpopulation (several individuals recorded) is in a mountainous area at high elevation in the Sneeuberg, and another subpopulation is in a high-elevation region (± 1 580 m a.s.l.) within Mountain Zebra National Park (two specimens collected in 1975 and in 1988), both in the Eastern Cape province (Branch 1999). The lack of records could be due to under-sampling (given the remote terrain) or could

Bitis inornata, Compassberg, Eastern Cape province (© G. Alexander).

possibly indicate that the species is range limited and/or is in decline. Regardless, a minimum EOO of 5 900 km² has been estimated based on the existing locality records. The EOO covers an area within which there is only 2% habitat transformation. While previously assessed as Endangered in 2017, this was based on an erroneously small EOO estimate, and by being at two threat-defined locations where habitat has been altered by agriculture and grazing. However, the national landcover spatial data suggests that habitat conversion is negligible.

Taxonomic notes: A phylogenetic study indicates that *B. inornata*, *B. albanica*, *B. armata* and *B. rubida* form a closely related species complex (Barlow et al. 2019) and the relationships between these taxa is worthy of further investigation. *Other important names*: none.

Distribution: This species has been recorded from just a few sites in the Sneeuberg and surrounding mountains (e.g., Compassberg) near Graaff-Reinet, Eastern Cape province, South Africa. It is possibly more widely distributed than records suggest as there is suitable habitat throughout the mountains that has not been extensively surveyed. The record from Mountain Zebra National Park was plotted incorrectly (in quarter degree grid 3125CD) in previous assessments. This record has been corrected (V. Egan, pers. comm. 2020), now being placed further south (in quarter degree grid 3225AB). A minimum EOO has been estimated based on records from four quarter degree grid cells, but the value could be much larger. Given there are few records from scattered localities, an interpreted distribution has not been estimated. *EOO*: 5 900 km².

Country of occurrence: South Africa.

Habitat and ecology: Recorded from high elevations (> 1 650 m a.s.l.) in Montane Grassland, but its elevational range is uncertain. Has been observed to take cover in tussocks of grass and under slabs of rock (Branch 1998). *Habitat*: Grassland.

Bitis inornata, Nieu-Bethesda, Eastern Cape province (© C. Keates).

Threats: It is suspected that the species is widespread throughout the inaccessible mountains, and there is little threat from habitat loss. *Use and trade*: The species is not known to be traded although it might be sought after by specialist collectors.

Population trend: There are few records, but this may represent sampling bias given that the species occurs in a remote area that is difficult to access. This assumption is supported by new records collected in 2018 during a dedicated survey for this species (A. Lynch and K. Lynch, unpubl. data 2018). Despite the few records to date, there is no evidence of population decline.

Conservation and research recommendations: A study aimed at gathering data on distribution and habitat requirements needs to be conducted. Improved information on taxonomy within a more detailed phylogenetic framework is needed.

Family **Viperidae**

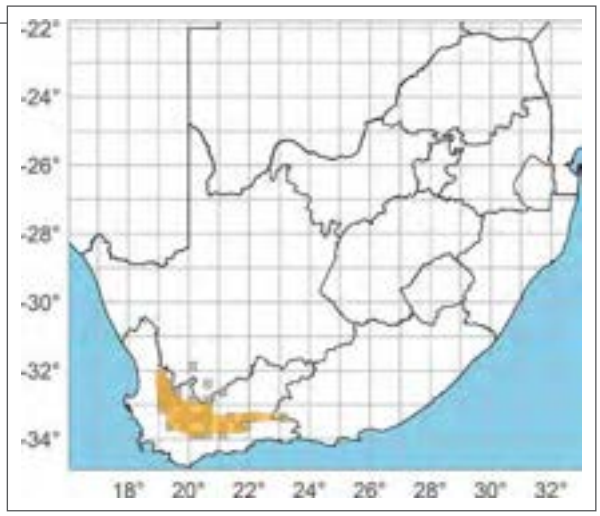
Bitis rubida Branch, 1997

Red Adder

South African endemic

LC – Least Concern (Global)

Assessors: Maritz, B., Turner, A.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: This species is fairly widespread and relatively common, with no major threats.

Taxonomic notes: A phylogenetic analysis of the genus shows that *B. rubida* is paraphyletic with regards to *B. inornata* and *B. albanica*, forming a species complex with *B. armata* and *B. cornuta* (Barlow et al. 2019). The relationships between these taxa is worthy of further investigation. *Other important names*: none.

Distribution: Distributed in southwestern South Africa, from the Cederberg and the eastern Great Escarpment, southwards through the Cape Fold Mountains and the Little Karoo (Branch 1999; Marais 2004). *EOO*: 61 000 km²; *Distribution*: 27 000 km².

Countries of occurrence: South Africa.

Habitat and ecology: Occurs on mountain slopes and sparsely vegetated gravel plains in Succulent Karoo, Fynbos and Renosterveld vegetation, sheltering under rocks (Branch 1998). *Habitat*: Shrubland.

Threats: No major threats. There is a possibility that this species could be collected in small numbers for the pet trade, but there is currently no data available to confirm this.

Population trend: The population size is thought to be stable as the mountainous habitat of this snake has not been significantly impacted by habitat transformation.

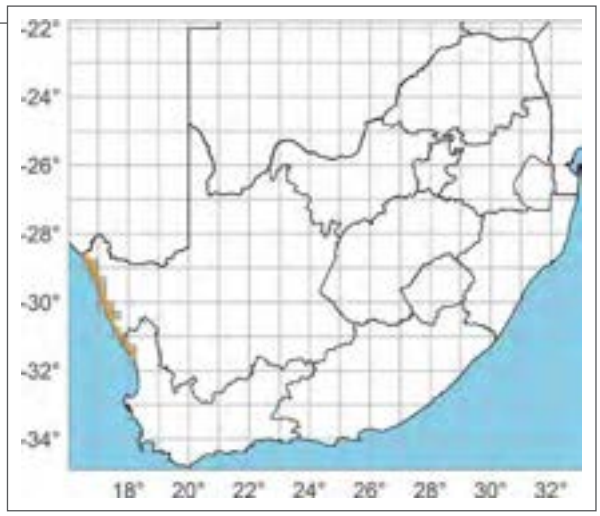
Conservation and research recommendations: A comprehensive phylogenetic analysis of the *B. rubida* clade is required to assess the species boundaries.

Bitis rubida, Kagga Kamma Nature Reserve, Western Cape province (© N.C. van Zyl).

Bitis rubida, Matjiesfontein region, Western Cape province (© M. Burger).

Bitis schneideri (Boettger, 1886)

Namaqua Dwarf Adder



LC – Least Concern (Regional)

Assessors: Tolley, K.A., Alexander, G.J., Weeber, J., Maritz, B., Turner, A.A.

Previous Red List categories:

2019: Least Concern (Global assessment).
2014: Least Concern (Global assessment).
1996: Vulnerable (Global assessment).
1994: Insufficiently Known (Global assessment).

Assessment rationale: *Bitis schneideri* is well protected and has a relatively large EOO that shows no decline in extent. Despite this, there has been some impact from surface mining and related land transformation, with approximately 70 km² of habitat lost since 1990 in the South African part of its range. However, the habitat loss is relatively small compared to the species' overall range, with most of the distribution either under formal protection or in a relatively natural state. Changes in ownership of mines could impact mining approaches and associated environmental policies might be in a state of flux, and this could pose a future threat.

Taxonomic notes: A phylogenetic study showed that *B. caudalis* is not monophyletic, with the South African population being closely related to *B. schneideri* and the Namibian population related to *B. peringueyi* (Barlow et al. 2019). However, this is unlikely to

Bitis schneideri, McDougall's Bay, Port Nolloth, Northern Cape province (© T. Ping).

affect the taxonomy of *B. schneideri*. *Other important names*: none.

Distribution: This species is endemic to the western margin of Namibia and South Africa. It occurs from the mouth of the Olifants River in the Western Cape province, South Africa, northwards to Lüderitz Bay in southwestern Namibia (Branch 1998). It occurs in coastal areas but may extend 100 km inland. *EOO*: 11 590 km^2; *Distribution*: 5 350 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: *Bitis schneideri* inhabits semi-vegetated sandy desert areas along the western margin of southwestern Africa. Despite high population densities in some parts of the range, they can experience relatively high annual mortality (Maritz & Alexander 2012), which is counterbalanced by frequent reproduction (Maritz & Alexander 2013). They are generalist predators that consume a wide range of small-bodied vertebrates (Maritz & Alexander 2014). *Habitat*: Desert, Shrubland.

Threats: Mining and associated activities have caused habitat transformation across some parts of the range in South Africa. This snake occurs in an area that is predicted to be heavily influenced by climate change (Engelbrecht et al. 2015), and this could be a threat in the future. *Use and trade*: This species is available in the pet trade, although the numbers of animals removed from the wild and the numbers bred in captivity are unknown.

Population trend: Maritz and Alexander (2012) showed that the species can occur at high population densities (approximately eight individuals per hectare) suggesting that the regional and global populations are quite large. However, some of the habitat in South Africa has been impacted by land transformation primarily for surface mining of diamonds, sand and minerals. While the population is likely to be relatively stable, there has been some loss of habitat that would have caused declines in the past and has fragmented the southern part of the species' range.

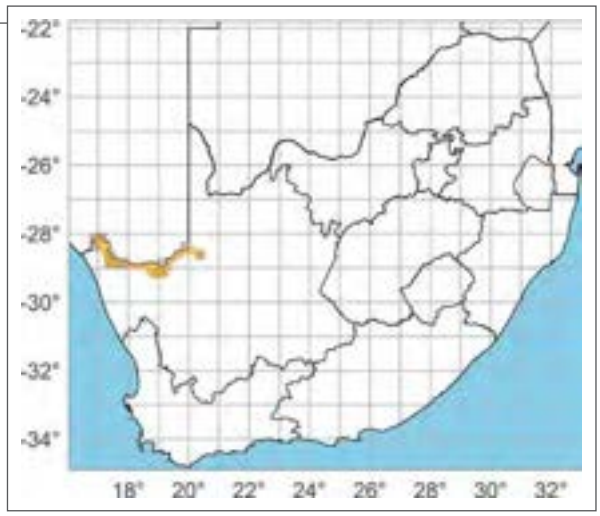
Conservation and research recommendations: Areas of the geographic distribution in South Africa that have not yet been impacted should be safeguarded and destroyed habitats in historically mined areas should be restored to their natural state. An assessment of the extent of pet trade would be important to understand whether this activity is a threat. Research on the extent of emerging pressures is required to assess population trends, i.e., the expanding mining footprint should be monitored to assess further declines in habitat quality and extent, and research on this species is needed to assess its response to predicted climate change.

Bitis xeropaga Haacke, 1975

Desert Mountain Adder

LC – Least Concern (Regional)

Assessors: Maritz, B., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: This habitat specialist has a moderately small range in South Africa. However, much of its range is remote and within protected areas. This species is available in the pet trade, but the level of trade and the potential impacts on wild populations are not known.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: In South Africa, the species is restricted to the mountainous and rough terrain near the lower Orange River, from the Augrabies region to the Richtersveld, extending northwards into southern Namibia to the Aus region (Phelps 2010). *EOO*: 31 400 km^2; *Distribution*: 9 710 km^2.

Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs on sparsely vegetated rocky desert slopes (Branch 1998), generally associated with mountains fringing major drainages. *Habitat*: Desert, Shrubland.

Threats: Although there is some collection for the pet trade, this has not been quantified and it is unknown whether this is a threat to wild populations. This snake occurs in an area that is predicted to be heavily influenced by climate change (Engelbrecht et al. 2015), and this could be a threat in the future.

Population trend: Because this snake occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: Quantification of collection for the pet trade will guide the appropriate response to this potential threat. Research on this species is needed to assess its response to predicted climate change.

Bitis xeropaga, captive specimen from unknown locality (© T. Ping).

Bitis xeropaga, Richtersveld National Park, Northern Cape province (© K. Kyle).

Family **Viperidae**

Causus defilippii (Jan, 1862)

Snouted Night Adder

LC – Least Concern (Regional)

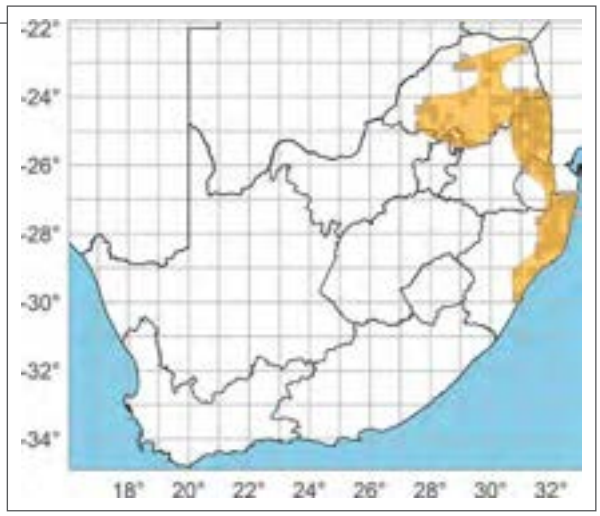
Assessors: Maritz, B., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: Widespread in South Africa with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs across East and southern Africa, from southern Kenya to South Africa and Eswatini (Branch 1998; Rasmussen 2005; Spawls & Branch 2020). In South Africa, it occurs in the northeast and into coastal KwaZulu-Natal province. *EOO*: 262 000 km²; *Distribution*: 125 000 km².



Countries of occurrence: Eswatini, Kenya, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in Woodland habitats throughout its range and may be locally abundant but rare in other areas (Johnson & Raw 1989). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

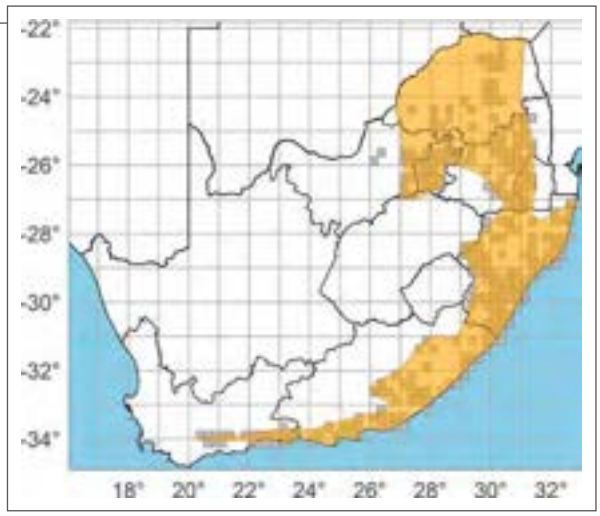
Causus defilippii, Caia, Mozambique (© L. Verburgt).

Causus rhombeatus (Lichtenstein, 1823)

Rhombic Night Adder

LC – Least Concern (Regional)

Assessors: Maritz, B., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (Regional assessment).

Assessment rationale: Widespread and common with no known substantial threats. It may be tolerant of some land transformation.

Taxonomic notes: Colouration variation occurs across its range and has led to the description of a new species from northern Zambia (Broadley 2014) and thus this species group is in need of a phylogenetic study. *Other important names*: none.

Distribution: Occurs widely throughout sub-Saharan Africa but is absent from the arid western and the forested central regions (Broadley 1990a; Branch 1998; Rasmussen 2005; Spawls & Branch 2020). In South Africa, it occurs throughout the northeast and the eastern margin of the country, extending along the southern coastal areas. Some records from the central regions of South Africa and from Lesotho are unconfirmed and are excluded from the current distribution. *EOO*: 870 000 km^2; *Distribution*: 356 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Nigeria, Rwanda, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs mainly in open mesic habitats, generally near water, but appears to be absent from dense forest. *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that tolerates some level of habitat transformation.

Conservation and research recommendations: A comprehensive phylogenetic analysis of *Causus* is required to assess the validity of recently described species and/or cryptic species.

Causus rhombeatus, Makhanda, Eastern Cape province (© C. Keates).

Causus rhombeatus, Verulam, KwaZulu-Natal province (© T. Ping)

Family **Atractaspididae**

Amblyodipsas concolor (Smith, 1849)

Natal Purple-glossed Snake

Regional endemic

LC – Least Concern (Global)

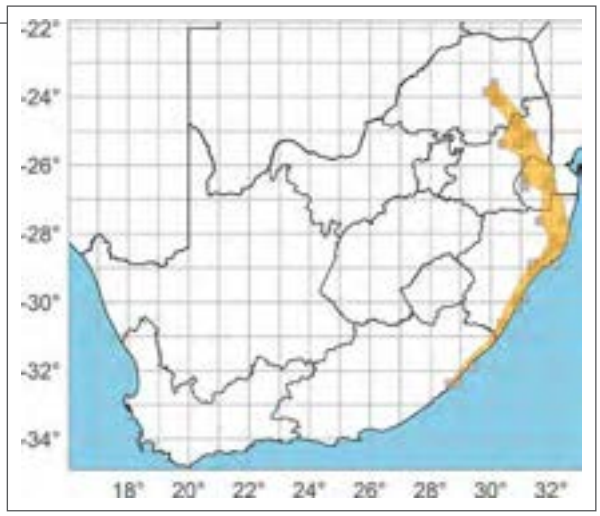
Assessors: Maritz, B., Burger, M.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: A widespread species with no substantial threats.

Taxonomic notes: A recent phylogeny suggests that this species should be elevated to a separate genus (Portillo et al. 2018), but additional work is needed to resolve the issue. *Other important names*: *Choristocalamus concolor*.

Distribution: Occurs along the northeastern margin of South Africa from the coastal regions of the Eastern Cape province, north through Eswatini into northeastern South Africa, possibly extending into adjacent southern Mozambique. *EOO*: 198 000 km²; *Distribution*: 53 100 km².



Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Generally associated with moist, well-wooded or forested regions (Jacobsen 1989; Broadley 1990a; Branch 1998), but records from a mountain escarpment (Wolkberg area) are from Grassland (M. Burger, pers. obs. 2008). Occurs from near sea level (Haagner 1994) to 1 650 m a.s.l. It is mainly fossorial, burrowing in humic soils and sheltering under rocks and rotting logs (Jacobsen 1989; Branch 1998). *Habitat*: Forest, Grassland.

Threats: Urbanisation and agriculture, especially in coastal KwaZulu-Natal province, have caused some habitat loss to the range of this snake. It may tolerate a degree of habitat transformation as it has been recorded from riparian forest within a sugarcane and plantation matrix (Maritz & Alexander 2007).

Population trend: Although there is some habitat loss across the range, the widespread range and abundance of this snake mitigates against the negative effects of local population declines.

Conservation and research recommendations: A taxonomic revision in terms of the genus assignment for this species is required.

Amblyodipsas concolor, Buffelskloof Private Nature Reserve, Mpumalanga province (© A. Jordaan).

Family **Atractaspididae**

Amblyodipsas microphthalma (Bianconi, 1852)

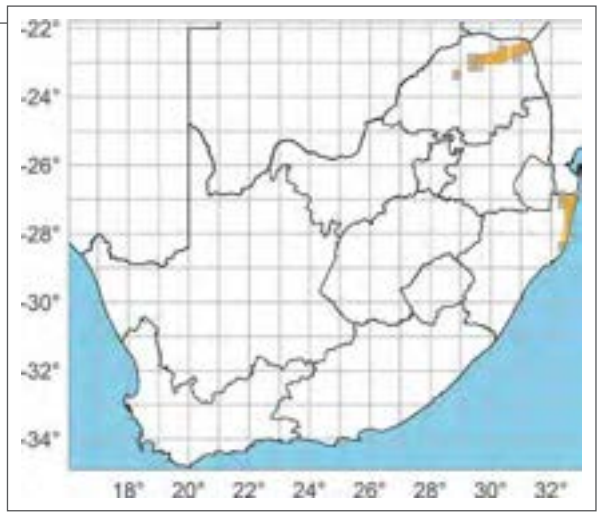
Eastern Purple-glossed Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Burger, M.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2010: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Amblyodipsas microphthalma microphthalma* – Least Concern (SARCA).
2014: *Amblyodipsas microphthalma nigra* – Least Concern (SARCA).



Assessment rationale: *Amblyodipsas microphthalma* is relatively widespread in eastern Limpopo and northeastern KwaZulu-Natal provinces, South Africa, as well as in adjacent southern Mozambique. Large parts of its distribution in South Africa fall within protected areas.

Taxonomic notes: *Amblyodipsas microphthalma nigra* was originally considered to be simply a melanistic form of *A. microphthalma* (e.g., FitzSimons 1962; Pienaar 1966, 1978; Broadley 1971b, 1983), until Jacobsen (1986) described it as a valid subspecies. A phylogenetic assessment is needed to clarify the status of the subspecies, particularly given the colour differences and different ecological preferences. *Other important names*: none.

Distribution: This species is distributed from southern Mozambique to eastern Limpopo and northeastern KwaZulu-Natal provinces, South Africa. It may also occur in Eswatini and Zimbabwe, although no records currently exist from these countries. It enters South Africa in northern KwaZulu-Natal and northern Limpopo. In Limpopo province there appears to be a gap in the distribution, with a potentially isolated subpopulation on the Makgabeng Plateau. *EOO*: 123 000 km^2; *Distribution*: 11 100 km^2.

Amblyodipsas microphthalma microphthalma, Kosi Bay, KwaZulu-Natal province (© K. Kyle).

Family Atractaspididae

Amblyodipsas microphthalma microphthalma, Kosi Bay, KwaZulu-Natal province (© D. van Eyssen).

Amblyodipsas microphthalma nigra, Soutpansberg, Limpopo province (© M. Petford).

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Occurs in a range of habitat types including rocky, broken terrain in Savannas (typical of the subspecies *A. m. nigra*; Jacobsen 1986), and deep aeolian sands and coastal alluvium in Savanna and Forest edge habitats (typical of the subspecies *A. m. microphthalma*; Jacobsen 1989). *Habitat*: Forest, Savanna.

Threats: There are no significant threats affecting this species.

Population trend: The species is considered stable due to the widespread range and its abundance, with large parts of the distribution in protected areas.

Conservation and research recommendations: The taxonomic status of the two subspecies should be assessed.

Family **Atractaspididae**

Amblyodipsas polylepis (Bocage, 1873)

Common Purple-glossed Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Burger, M.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

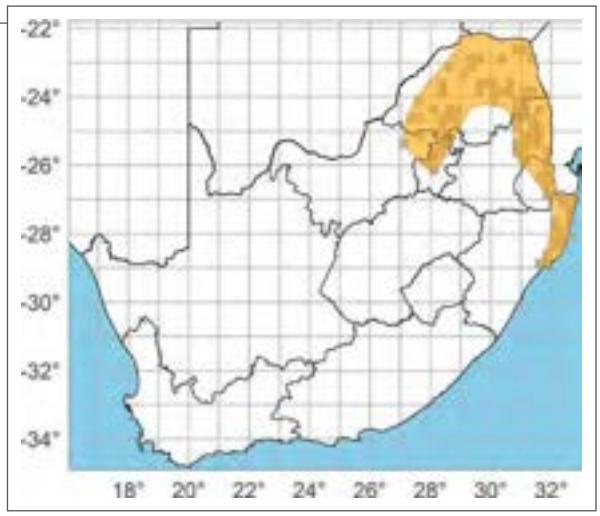
Subspecies assessed:
2014: *Amblyodipsas polylepis polylepis* – Least Concern (SARCA).

Assessment rationale: This species is widely distributed and common across much of southern Africa.

Taxonomic notes: The taxonomic validity of the subspecies *A. polylepis hildebrandtii*, which occurs in East Africa, has yet to be assessed using molecular phylogenetics. *Other important names*: *Amblyodipsas polylepis polylepis*; *Amblyodipsas polylepis hildebrandtii*.

Distribution: Widely distributed in sub-Saharan Africa between southern latitudes of 10° and 31° (Broadley 1971b, 1990b; Jacobsen 1989; Branch 1998). It occurs in the northeastern parts of South Africa, from the eastern extremes of North West, northern Gauteng, Limpopo and Mpumalanga provinces, south into KwaZulu-Natal province, becoming restricted to the coastal areas in the south. Outlier records from Commondale and Estcourt (FitzSimons 1962) are excluded from the map since they are based on old Durban Snake Park records, which are not supported by voucher specimens and may be referable to *Macrelaps microlepidotus*. The recording system used by the snake park was based on locality information of the train station from which the specimen was sent, and so the geographic precision of the records is also in doubt. No verifiable recent records or records with voucher specimens have been made south of Mtunzini. This may indicate a recent retraction of range or be due to all records south of Mtunzini being based on misidentifications. *EOO*: 271 000 km²; *Distribution*: 151 000 km².

Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Eswatini, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.



Habitat and ecology: Primarily fossorial, occurring in a variety of vegetation types. In South Africa it is found from near sea level to 1 300 m a.s.l. (Jacobsen 1989; Broadley 1990a; Branch 1998). *Habitat*: Forest, Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is considered stable due to the widespread range and abundance of this species that mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Amblyodipsas polylepis polylepis, Vivo, Limpopo province (© R.I. Stander).

Family Atractaspididae

Amblyodipsas ventrimaculata (Roux, 1907)

Kalahari Purple-glossed Snake

LC – Least Concern (Regional)

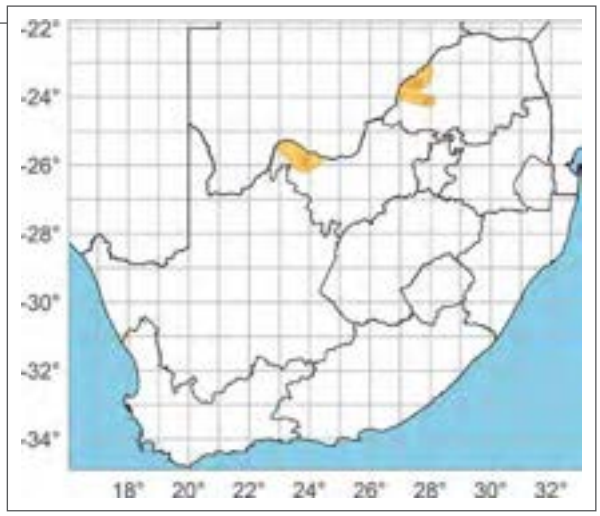
Assessors: Alexander, G.J., Tolley, K.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2010: Least Concern (Global IUCN assessment).

Taxonomic notes: No issues. *Other important names*: none.

Assessment rationale: Widespread with no major threats.

Distribution: Occurs from southern Angola and western Zambia across Namibia and Botswana to northern South Africa (Broadley 1971b; Verburgt et al. 2018; Butler et al. 2019). It extends into South Africa in only two small areas, north-western Limpopo province (Verburgt et al. 2018) and northern North West province. *EOO*: 73 000 km²; *Distribution*: 18 200 km².



Countries of occurrence: Angola, Botswana, Namibia, South Africa, Zambia, Zimbabwe.

Threats: In some parts of the global distribution this species may be impacted by habitat transformation, including subsistence agriculture and urbanisation. However, these impacts are localised and have a relatively small impact on the population. The South African population is not believed to be under threat.

Population: The widespread range and presumed abundance of this species mitigates against effects of local population declines that might be caused by habitat loss. The South African population is believed to be stable as it occurs in an area without any significant habitat transformation.

Habitat and ecology: Occurs in sandy soils across the Kalahari region. In South Africa, it is restricted to arenosol and lixisol soils (Verburgt et al. 2018). *Habitat*: Savanna

Conservation and research recommendations: No recommendations.

Amblyodipsas ventrimaculata, Lephalale, Limpopo province (© L. Verburgt).

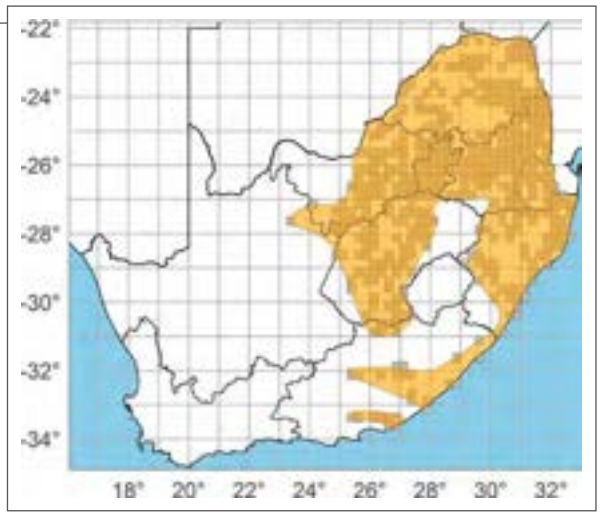
Family **Atractaspididae**

Aparallactus capensis Smith, 1849

Black-headed Centipede-eater

LC – Least Concern (Regional)

Assessors: Maritz, B., Burger, M.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2011: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common, with no known substantial threats.

Taxonomic notes: A recent phylogenetic study of the Aparallactinae indicates that *A. capensis* consists of multiple cryptic lineages, the taxonomic status of which require further investigation (Portillo et al. 2018) and may be assignable to known subspecies: *A. c. bocagii* and *A. c. punctatolineatus*. The relationship between *A. capensis* and *A. nigriceps* from southern Mozambique was not explored in Portillo et al. (2018) and this is worth further investigation. *Other important names*: none.

Distribution: Widespread in southern Africa, from South Africa into East Africa and west to Angola and northern Namibia (Broadley 1990a; Spawls et al. 2018). Regionally, it occurs throughout much of the east, but is absent from the eastern escarpment and central Eastern Cape province. There is a single record from central Lesotho (Ambrose 2006) that requires verification. *EOO*: 765 000 km^2; *Distribution*: 523 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Terrestrial, with an affinity for old termitaria. Present in a wide variety of habitat types from near sea level up to 2 300 m a.s.l. (Jacobsen 1989; Broadley 1990a; Branch 1998). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no known substantial threats.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not severely impacted by habitat transformation.

Conservation and research recommendations: The presence of multiple cryptic lineages within this taxon require investigation.

Aparallactus capensis, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Aparallactus capensis, Buffelskloof Private Nature Reserve, Mpumalanga province (© L. Verburgt).

Family Atractaspididae

Aparallactus lunulatus (Peters, 1854)

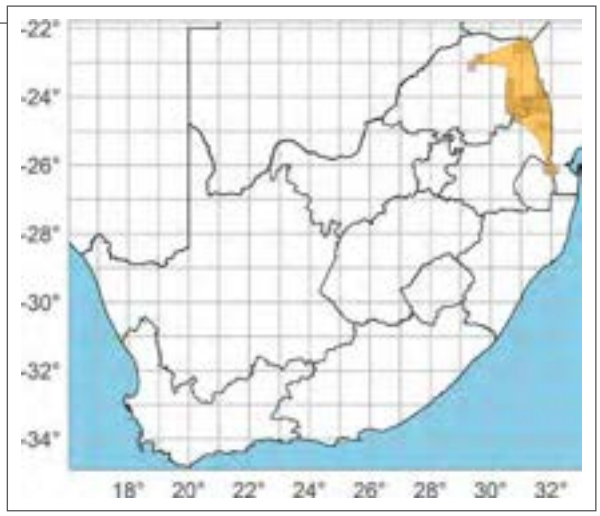
Plumbeous Centipede-Eater

LC – Least Concern (Regional)

Assessors: Maritz, B., Burger, M.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Aparallactus lunulatus lunulatus* – Least Concern (SARCA).



Assessment rationale: Although not particularly widespread in the region, this snake occurs in areas that are not under significant threat from habitat loss.

Taxonomic notes: There are several subspecies (*A. l. lunulatus*, *A. l. scortecci* and *A. l. nigrocollaris*) within this widespread species. A phylogenetic assessment shows genetic structure within the species, but it is unknown whether this corresponds with the described subspecies (Portillo et al. 2018). *Other important names*: none.

Distribution: Occurs widely throughout eastern Africa from Chad to South Africa (Broadley 1990a; Branch 1998; Portillo et al. 2018). In the region, it occurs in the northeast from eastern Limpopo province into northeastern Eswatini (Boycott 1992a). *EOO*: 58 000 km²; *Distribution*: 40 300 km².

Countries of occurrence: Chad, Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Shelters under rocks and rotting logs in rocky, sandy or clay soils (Jacobsen 1989; Broadley 1990a; Branch 1998). In East Africa it has an affinity for stony substrates in Savanna

Aparallactus lunulatus lunulatus, Hoedspruit, Limpopo province (© C.R. Hundermark).

Aparallactus lunulatus lunulatus, Victoria Falls, Zimbabwe (© C. & S. Dorse).

Aparallactus lunulatus lunulatus, juvenile, Hoedspruit, Limpopo province (© D.W. Pietersen).

and semi-desert (Spawls et al. 2018). The elevational range is from sea level to 2 200 m a.s.l. (Spawls et al. 2018). *Habitat*: Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population is considered stable due to the widespread range and abundance of this species that mitigate against the negative effects of local population declines.

Conservation and research recommendations: The taxonomic status of the subspecies should be evaluated using a phylogenetic assessment with comprehensive geographic sampling.

Family Atractaspididae

Atractaspis bibronii Smith, 1849

Bibron's Stiletto Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Burger, M.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, with no known substantial threats.

Taxonomic notes: Several cryptic taxa appear to be subsumed under the name *Atractaspis bibronii* (Nagy et al. 2005; Portillo et al. 2019). *Other important names*: *Atractaspis rostrata*.

Distribution: Widely distributed in sub-Saharan Africa, extending from southern Somalia southwards to South Africa and westwards to eastern Angola, with an apparently disjunct population in central-western Angola (Broadley 1990a, 1991; Spawls & Branch 2020; Dobiey & Vogel 2007; Marques et al. 2018). In the region, most records are from the northeast, southwards into KwaZulu-Natal province. Records in the arid northwest region are scattered. *EOO*: 912 000 km^2; *Distribution*: 488 000 km^2.

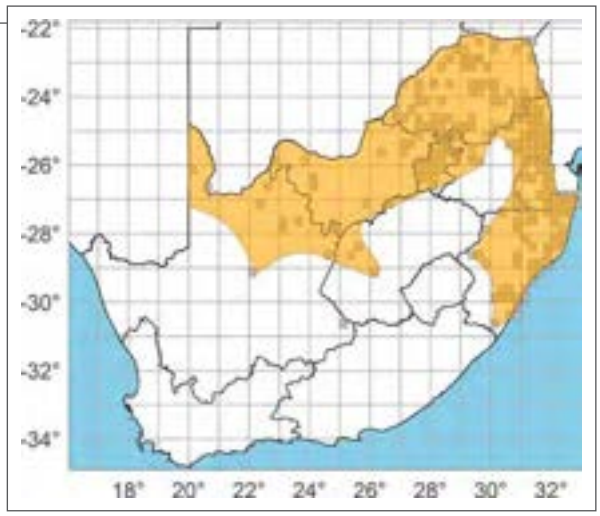
Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Rwanda, Somalia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Primarily fossorial. Often found in termitaria or on soil under logs or rocks, in a variety of habitat types, from about sea level to at least 1 600 m a.s.l. (Jacobsen 1989). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no known substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species.

Conservation and research recommendations: Morphological and phylogenetic analyses are needed to assess cryptic species in this taxon, with comprehensive sampling across the range.



Atractaspis bibronii, Medike, Limpopo province (© R.I. Stander).

Atractaspis bibronii, Lephalale, Limpopo province (© L. Verburgt).

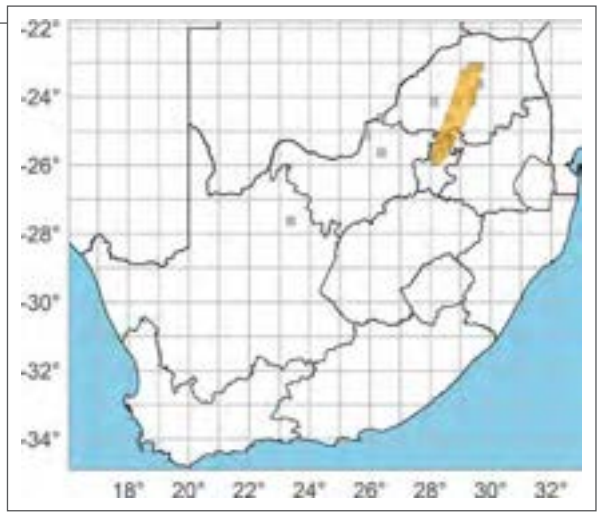
Family **Atractaspididae**

Atractaspis duerdeni Gough, 1907

Duerden's Stiletto Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Burger, M.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Relatively widespread, with no significant threats.

Taxonomic notes: No notable taxonomic issues. *Other important names*: none.

Distribution: Occurs in north-central Namibia and southeastern Botswana into northern South Africa (Broadley 1990a, 1991; Branch 1998; Marais 2004; Dobiey & Vogel 2007), although there are no records from the Kalahari area (Broadley 1991; Spawls & Branch 2020). Most of the South African records are from Limpopo and Gauteng provinces, with scattered records from North West and Northern Cape provinces. Given that this species is difficult to observe, the scattered records could mean that the range is significantly larger than the interpreted distribution currently suggests. *EOO*: 118 000 km²; *Distribution*: 22 400 km².

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: A poorly known fossorial species that inhabits sandy soil. In South Africa it occurs at elevations of 1 250–1 500 m a.s.l. (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: Because this snake occurs mainly in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: A better estimate of the western extent of the distribution in South Africa is needed, as is an assessment of the taxonomic status of potentially disjunct subpopulations (Namibia, Botswana/South Africa).

Atractaspis deurdeni, Kalkbank, Limpopo province (© R.I. Stander).

Family Atractaspididae

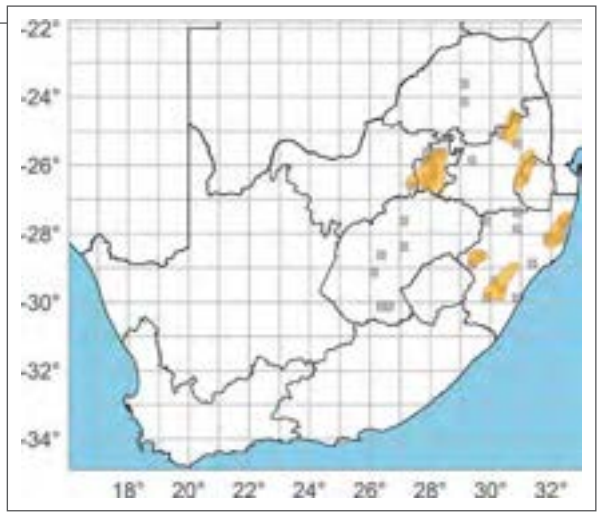
Homoroselaps dorsalis (Smith, 1849)

Striped Harlequin Snake

Regional endemic

NT – Near Threatened A2c (Global)

Assessors: Alexander, G.J., Tolley, K.A., Weeber, J., Conradie, W., Maritz, B., Pietersen, D.W.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).
1996: Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Reason for recent change: Non-genuine (2018 to 2022).

Reason for previous change: Non-genuine (2017 to 2018).

Assessment rationale: This species is widespread but has a naturally patchy distribution. However, some areas of the range have undergone moderate to severe habitat loss, and this has apparently led to local extinctions of two subpopulations, i.e., in the southeastern Free State and northern Limpopo provinces. Individuals have not been recorded from

Homoroselaps dorsalis, Suikerbosrand Nature Reserve, Gauteng province (© G. Alexander).

those areas in at least 50 years, and it is uncertain if these subpopulations are extant. If these subpopulations have gone extinct, this would result in a 40% reduction in EOO from 320 000 to 195 000 km^2. Thus, there is significant uncertainty around the estimation of EOO, whether there has been a decline in the number of subpopulations and a corresponding decline in the number of mature individuals. If these subpopulations are extant and viable, a Least Concern category would be appropriate. If there has been a significant reduction in the number of mature individuals (e.g., 40% reduction in EOO leading to a similar decline in the population) then the species could be assessed as Vulnerable under A2c. The generation length is however, not known nor is the timing of the extinction of subpopulations. Given this uncertainty, a precautionary approach has been taken and the species is considered Near Threatened under criterion A based on an estimated population reduction due to a suspected loss of subpopulations in part of the range and with an estimated generation time of 5–6 years. This could translate to a population decline of about 20% over the past three generations. Assessed as Near Threatened in 2017 due to a decline in habitat quality and extent and the population being severely fragmented but with a EOO too large to qualify as threatened. However, this was downlisted in 2018 as the subpopulations did not qualify as severely fragmented under criterion B given that more than half the individuals were unlikely to be in small, isolated subpopulations.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Has a very patchy distribution across most of northeastern South Africa into western Eswatini. Historically it occurred from northern Limpopo province, southwards into the southern Free State province and east to KwaZulu-Natal province. The northern Limpopo and Free State subpopulations have not been verified in 50 years and are likely locally extinct, and the other subpopulations have apparently contracted in range. The polygons on the range map indicate subpopulations with both recent and historical records, while records at least 50 years old are shown as quarter degree grid cells. A recent record from Northern Cape province near Kuruman (G. Alexander, unpubl. data 2021), approximately 300 km west of all other records, requires verification and has not been included as part of the distribution map or EOO estimate. *EOO*: 195 000–320 000 km^2; *Distribution*: 42 800 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Partially fossorial and known to inhabit moribund termitaria in Grasslands between elevations of 100 to 1 800 m a.s.l. *Habitat*: Grassland.

Threats: There is substantial degradation of Grasslands across the species' range due to urbanisation, mining and agriculture, and at least 40% of the Grassland habitat has been lost (Skowno et al. 2019).

Population trend: The population is inferred to have declined due to habitat losses as Grasslands have become transformed across its range, with the loss of several historical subpopulations and the contraction of others. It is suspected that there has been a decline in mature individuals due to the loss of these subpopulations. Although the distribution is naturally patchy, with the current information, it is not possible to assess whether the population is severely fragmented.

Conservation and research recommendations: Targeted surveys within the historical subpopulations as well as across the broader distribution are needed to increase confidence regarding the decline or loss of subpopulations.

Family Atractaspididae

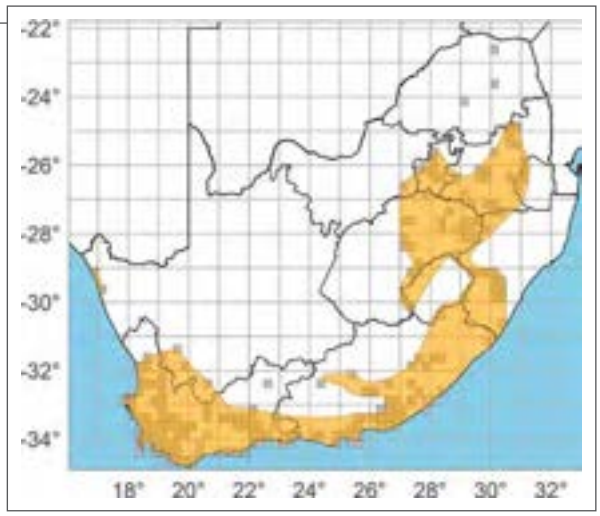
Homoroselaps lacteus (Linnaeus, 1758)

Spotted Harlequin Snake

Regional endemic

LC – Least Concern (Global)

Assessors: Maritz, B., Burger, M.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no significant threats.

Taxonomic notes: There are three distinct colour morphs within this species that appear to form broadly parapatric populations, with a barred pattern in the southwest, blotched pattern in the east and striped pattern in the north (Maritz et al. 2019). Although it has been speculated that these may be distinct species, preliminary analyses using scale counts and DNA sequencing have been inconclusive to date due to insufficient geographic coverage of the specimens included (Maritz et al. 2019). *Other important names*: none.

Distribution: Widespread in South Africa from the extreme southwest, into the central northeastern regions, extending into western Eswatini, with

Homoroselaps lacteus, Cape Town, Western Cape province (© C. & S. Dorse).

Family Atractaspididae

Homoroselaps lacteus, Makhanda, Eastern Cape province (© C. Keates).

Homoroselaps lacteus, Warden, Free State province (© C.R. Hundermark).

scattered records in Limpopo province. It extends along the eastern Great Escarpment, and possibly is more extensive along the escarpment, as there is an isolated record from the Karoo National Park (Branch & Braack 1989). There is a distribution gap across the arid areas of South Africa (De Waal 1978; Jacobsen 1989; Broadley 1990a; Bourquin 2004), however, there are a few isolated historical records from the northwest coastal area of the Northern Cape province, South Africa. There are no records from Lesotho, but it possibly occurs in the western, lower elevation area of that country. Outlying historical literature records from Kimberley, Northern Cape province (FitzSimons 1962; Burger 2014a) are in error. *EOO*: 1 207 000 km^2; *Distribution*: 347 000 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: A semi-fossorial snake that occurs in sandy substrates, old termitaria and under rocks, from near sea level to elevations of 1 800 m a.s.l. (De Waal 1978; Jacobsen 1989; Spawls & Branch 2020; Bourquin 2004). *Habitat*: Grassland, Shrubland.

Threats: There are no major threats to this widespread snake.

Population trend: Although there is some habitat loss across the range, the widespread range of this snake mitigates against the negative effects of local population declines.

Conservation and research recommendations: A more detailed assessment of the taxonomic status of the different colour morphs should be made, that includes more comprehensive geographic sampling.

Family Atractaspididae

Macrelaps microlepidotus (Günther, 1860)

Natal Black Snake

South African endemic

LC – Least Concern (Global)

Assessors: Maritz, B., Burger, M.

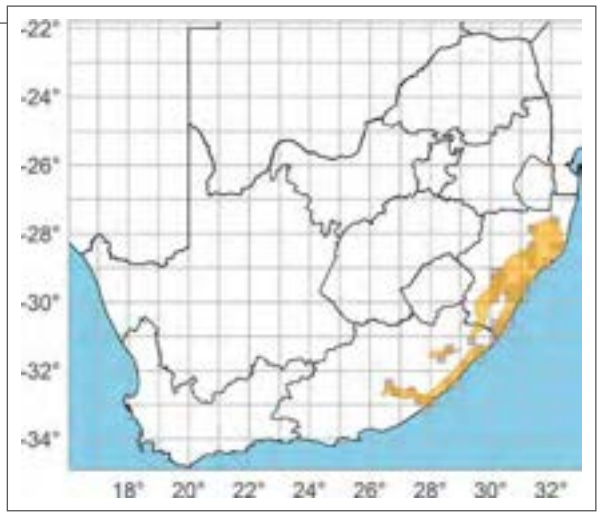
Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This snake is fairly widespread but is restricted to forest patches. Although there may have been a minor historical decline due to a relatively small amount of forest loss, this threat is not considered significant. Although assessed as Near Threatened in 2017 due to a decline in habitat quality and extent, this was based on an underestimation of AOO that did not follow the IUCN methodology (IUCN 2019).

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs along the eastern margin of South Africa from northern KwaZulu-Natal province southwards into the Eastern Cape province, from forests along the coast to Afrotemperate forests a few hundred kilometres inland (Bourquin 2004; Conradie et al. 2012; Conradie & Busschau 2018). It occurs primarily in forest patches, or in close proximity to forest, thus the distribution is naturally patchy. There



are a few records from outside forest patches (e.g., in agricultural areas), but most of these are historical records where forest might have originally occurred. The record from Kosi Bay near the Mozambique border (Burger 2014b) is a misidentified *Amblyodipsas polylepis* (W Conradie, pers. comm. 2018), meaning that the likelihood of this species occurring in southern Mozambique is lower than initially thought. *EOO*: 108 000 km^2; *Distribution*: 50 100 km^2.

Country of occurrence: South Africa.

Habitat and ecology: A semi-fossorial species with a strong affinity for forests, where it shelters in moist leaf litter and humic soil, usually in damp localities (Broadley 1990a; Branch 1998; Marais 2004). There are some historical records from what are currently agricultural and urban areas, but this is probably not core habitat for this snake. *Habitat*: Forest, Grassland, Savanna.

Threats: Although there was some historical decline of quality and extent of forest, this biome is not considered severely threatened and most forest patches are intact (see Skowno et al. 2019). Therefore, there are no significant threats to this species.

Population trend: Although the population may have experienced a minor decrease historically due to forest loss, the population is currently considered stable.

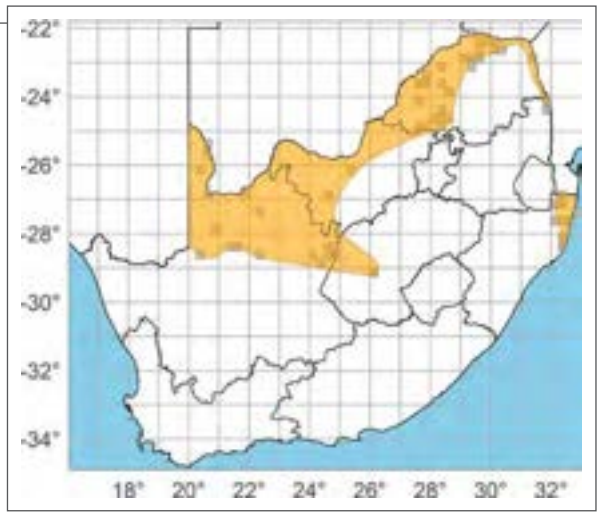
Conservation and research recommendations: Improved information regarding the possible degree of habitat fragmentation and the possible effects of this on this species would improve confidence in the assessment.

Macrelaps microlepidotus, Baziya, Eastern Cape province (© T. Busschau).

Family **Atractaspididae**

Xenocalamus bicolor Günther, 1868

Bicoloured Quill-snouted Snake



LC – Least Concern (Regional)

Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Xenocalamus bicolor bicolor* – Least Concern (SARCA).
2014: *Xenocalamus bicolor australis* – Least Concern (SARCA).
2014: *Xenocalamus bicolor lineatus* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Xenocalamus bicolor bicolor* Günther, 1868.
- *Xenocalamus bicolor lineatus* Roux, 1907.
- *Xenocalamus bicolor australis* FitzSimons, 1946.

Assessment rationale: This widespread species is rarely encountered, probably because of its fossorial habits. Despite the rarity, it is not thought to be under any significant threats.

Taxonomic notes: Phylogenetic analyses suggest that the genus *Xenocalamus* should be synonymised with *Amblyodipsas* (Figueroa et al. 2016; Portillo et al. 2018), but this needs to be confirmed with better taxon sampling. There are several subspecies of *X. bicolor*, some of which are in doubt due to the occurrence of morphologically intermediate specimens (Jacobsen 1989). Although Portillo et al. (2018) include material of some of the subspecies of *X. bicolor*, more in-depth

Xenocalamus bicolor, Groblershoop, Northern Cape province (© D.W. Pietersen).

Family Atractaspididae

Xenocalamus bicolor, Lephalale, Limpopo province (© G.K. Nicolau).

Xenocalamus bicolor, Waterpoort, Limpopo province (© M. Petford).

phylogenetic analysis of the relationships among the subspecies is required. *Other important names*: none.

Distribution: Occurs across most of southern Africa (Broadley 1971b; Marques et al. 2018; Baptista et al. 2019; Chippaux & Jackson 2019). In South Africa, it is distributed across the northern areas from the Kalahari region extending eastwards to northern Limpopo province and southwards to coastal KwaZulu-Natal province. *EOO*: 779 000 km^2; *Distribution*: 254 000 km^2.

Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Malawi, Mozambique, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Fossorial, occurring in deep alluvial and aeolian sands (Jacobsen 1989; Branch 1998). *Habitat*: Savanna.

Threats: Habitat transformation for agricultural purposes has occurred in the past, but this threat is not currently considered to be having an impact.

Population trend: Despite there being some habitat transformation across the range, this species' widespread distribution probably mitigates against the negative effects of local population declines.

Conservation and research recommendations: Phylogenetic analysis of relationships among the various subspecies of *X. bicolor* is required.

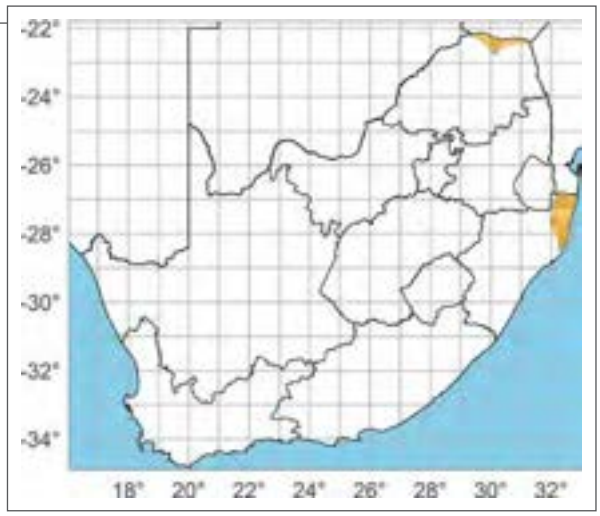
Family **Atractaspididae**

Xenocalamus transvaalensis Methuen, 1919

Speckled Quill-snouted Snake

LC – Least Concern (Regional)

Assessors: Pietersen, D.W., Conradie, W., Alexander, G.J., Weeber, J., Burger, M., Tolley, K.A.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (Global assessment).
1996: Data Deficient (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Assessment rationale: Although this snake is widespread in Mozambique, the range in South Africa is limited. There is some habitat transformation where it occurs, but a large portion of the distribution is within a protected area.

Taxonomic notes: Phylogenetic analyses suggest that the genus *Xenocalamus* should be synonymised with *Amblyodipsas* (Figueroa et al. 2016; Portillo et al. 2018), but this needs to be confirmed with better taxon sampling. *Other important names*: none.

Distribution: Although there are few records from Mozambique, it is probably widespread in southern Mozambique occurring as far north as Inhambane (ReptileMap: 168571, 185256). It has a fragmented distribution in South Africa, where it occurs in northeastern KwaZulu-Natal and northern Limpopo provinces. These areas are presumably linked through Mozambique through the sandveld habitat. This species has recently been recorded from Zimbabwe, just north of the Limpopo River. It might also occur in Botswana, but it has not yet been recorded from there. Records from South Africa are scant with only 40 unique records, half of which were made prior to 1995. *EOO*: 95 000 km^2; *Distribution*: 13 400 km^2.

Xenocalamus transvaalensis, Kosi Bay, KwaZulu-Natal province (© D. van Eyssen).

Family **Atractaspididae**

Xenocalamus transvaalensis, Hluhluwe, KwaZulu-Natal province (© L. Verburgt).

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Mostly fossorial, occurring in deep sands (Jacobsen 1989), and has been recorded from the Indian Ocean Coastal Belt and mopane (*Colophospermum mopane*) bushveld vegetation types within the Savanna biome. *Habitat*: Savanna.

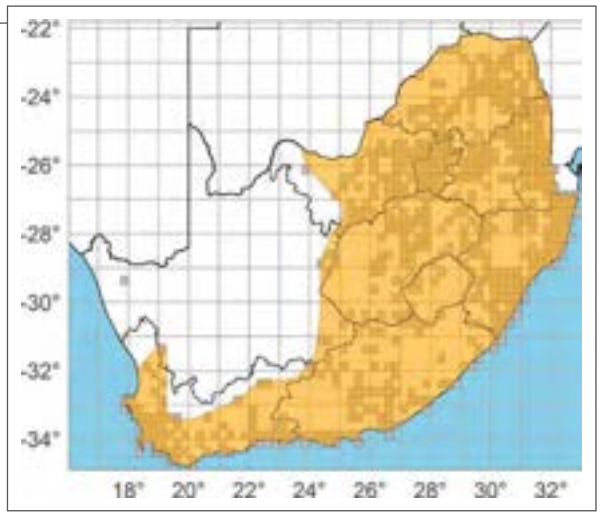
Threats: Although there are no major threats to this snake, outside protected areas the habitat is significantly transformed, and this could have local impacts.

Population trend: A substantial portion of the distribution is within a large, protected area, where there has been no habitat transformation. While there are probably some local declines due to habitat loss outside the protected area, the overall population size is assumed to be stable.

Conservation and research recommendations: There are relatively few recent records of this species, so additional information on the range would be useful to guide future assessments.

Crotaphopeltis hotamboeia (Laurenti, 1768)

Red-lipped Snake, Herald Snake



LC – Least Concern (Regional)

Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: Although this species has a wide distribution in sub-Saharan Africa, a phylogeographic analysis suggests that it is a single taxon (Engelbrecht et al. 2020). Thus, there are no taxonomic issues. *Other important names*: none.

Distribution: Widespread in the eastern and southern parts of southern Africa, extending northwards to tropical Africa (Broadley 1990a; Branch 1998). In the region, it occurs in the more mesic eastern half of South Africa, extending into Lesotho and Eswatini. *EOO*: 1 310 000 km²; *Distribution*: 850 000 km².

Countries of occurrence: Angola, Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Eswatini, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Kenya, Lesotho, Liberia, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Uganda, United Republic of Togo, Zambia, Zimbabwe.

Habitat and ecology: Usually occurs in damp areas in Fynbos, Lowland Forest, Savanna and Grassland (Branch 1998). Commonly found sheltering under rocks and in old termitaria (De Waal 1978; Jacobsen 1989). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.

Crotaphopeltis hotamboeia, Karoo National Park, Western Cape province (© W. Conradie).

Crotaphopeltis hotamboeia, Little Dene, Hogsback, Eastern Cape province (© W. Conradie).

Family **Colubridae**

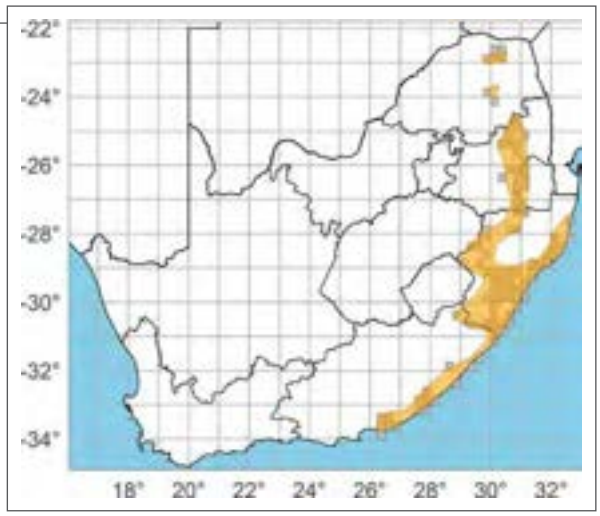
Dasypeltis inornata Smith, 1849

Southern Brown Egg-eater

Regional endemic

LC – Least Concern (Global)

Assessors: Turner, A.A., Marais, J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no major threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs along the eastern margin of South Africa including western Eswatini, from the extreme northeast of Limpopo province to the southern coastal region of the Eastern Cape province. *EOO*: 354 000 km²; *Distribution*: 99 900 km².

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: This snake occurs in a variety of habitats, sheltering under rocks on rock or soil, from near sea level to over 1 600 m a.s.l. (Jacobsen 1989; Branch 1998). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no major threats to this widespread and relatively abundant snake.

Population trend: Although there has been some habitat loss in the area, the large geographic range and abundance of this snake mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Dasypeltis inornata, Hluleka Nature Reserve, Eastern Cape province (© W. Conradie).

Family **Colubridae**

Dasypeltis medici (Bianconi, 1859)

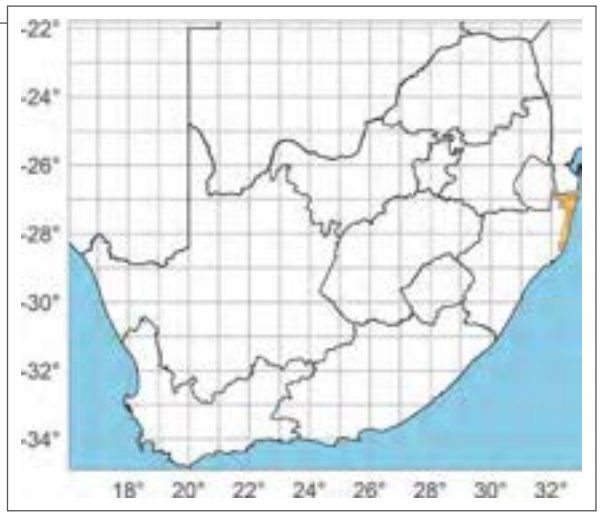
East African Egg-eater

LC – Least Concern (Regional)

Assessors: Turner, A.A., Marais, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Dasypeltis medici medici* – Least Concern (SARCA).



Assessment rationale: This species has a restricted range in South Africa and Eswatini but is widespread and common elsewhere, with about 35% of the range falling within the iSimangaliso Wetland Park and World Heritage Site and is therefore not considered threatened. Nevertheless, there is an emerging threat of socioeconomically driven land invasion into the protected area by local communities, and this should be monitored. If this threat becomes active and given the relatively small EOO, much of which falls within the protected area, this species could rapidly become threatened.

Taxonomic notes: *Dasypeltis medici lamuensis* is a junior synonym of *D. medici* (Bates & Broadley 2018). The taxonomic status, particularly in terms of the recently synonymised subspecies *D. m. lamuensis*, requires further investigation. *Other important names*: none.

Distribution: Regionally, this species occurs from St Lucia in northeastern KwaZulu-Natal province in South Africa. It also extends outside the region, northwards into Mozambique, eastern Zimbabwe and Tanzania to southern Somalia (Broadley 1990a; Spawls et al. 2018; Bates & Broadley 2018), with a single record from eastern Zambia (Broadley et al. 2003). *EOO*: 8 640 km^2; *Distribution*: 5 020 km^2.

Dasypeltis medici, St Lucia, KwaZulu-Natal province (© C. & S. Dorse).

Dasypeltis medici, Cica, Mozambique (© C. & S. Dorse).

Family **Colubridae**

Countries of occurrence: Eswatini, Kenya, Malawi, Mozambique, Somalia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Found in lowland Evergreen Forest and Moist Savanna (Broadley 1990a; Marais 2004). *Habitat*: Forest, Savanna.

Threats: Although there are no known active threats. Nearly 35% of the South African range falls within the iSimangaliso Wetland Park and World Heritage Site, which provides a refuge for this species from land transformation and degradation. Despite the official protection status, the park has become vulnerable to the threat of socioeconomically driven land invasion by local communities. Given that other protected areas in South Africa recently have been de-gazetted due to land invasions in favour of informal human settlement (e.g., Western Cape Government 2022), this is a plausible emerging threat.

Population trend: The widespread range and abundance of this species mitigates against the negative effects of local population declines.

Conservation and research recommendations: Given the emerging threat of socioeconomically driven land invasion by local communities within protected areas that forms a large portion of this species' distribution, changes in land use and potential rapid habitat destruction will require careful monitoring.

Family **Colubridae**

Dasypeltis scabra (Linnaeus, 1758)

Rhombic Egg-eater

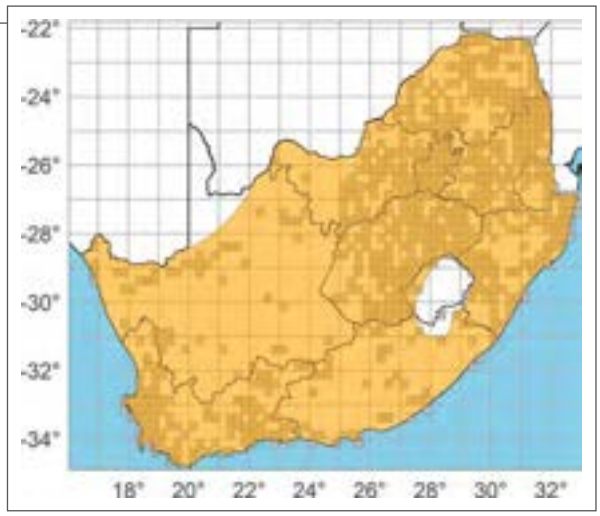
LC – Least Concern (Regional)

Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no substantial threats.

Taxonomic notes: This species has a complex recent taxonomic history, with several cryptic taxa still known to be subsumed under the name *D. scabra* (Trape et al. 2012; Bates & Broadley 2018). The Egyptian population has been split off as *D. bazi* (Saleh & Sarhan 2016), while Bates and Broadley (2018) described *D. taylori* from northern Somalia and *D. arabica* from Saudi Arabia and Yemen, both from material previously assigned to *D. scabra*. In line with the lineage-based species concept applied by Bates and Broadley (2018), these authors recognised *D. s. loveridgei* from Namibia as a full species. *Other important names*: none.



Distribution: Widespread throughout most of southern Africa, extending to Sudan and Ethiopia in the north and to at least the Republic of the Congo in the west (Trape et al. 2012; Bates & Broadley 2018). Regionally, it occurs over most of South Africa and Eswatini, although records are patchy in parts of the Eastern and Northern Cape provinces of South Africa. Not recorded from the higher elevations in Lesotho. Although previously mapped as being in the central

Dasypeltis scabra, Hoedspruit, Limpopo province (© C.R. Hundermark).

Family **Colubridae**

Dasypeltis scabra, near Calitzdorp, Western Cape province (© T. Ping).

Dasypeltis scabra, Nieu-Bethesda, Eastern Cape province (© C. Keates).

Kalahari (Marais 2014a), this was based on an incorrectly georeferenced locality. *EOO*: 1 440 000 km^2; *Distribution*: 1 199 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, Somalia, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a variety of habitats but absent from true deserts and Closed-Canopy Forests. Shelters in moribund termitaria, under rocks, in rock crevices, under tree bark and in rotting logs (De Waal 1978; Jacobsen 1989; Marais 2004). *Habitat*: Forest, Desert, Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species. *Use and trade*: Widely available in the pet trade.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: The taxonomy of this species in southern Africa should be investigated, as the presence of cryptic taxa has been suggested (Bates et al. 2011, 2012).

Dipsadoboa aulica (Günther, 1864)

Marbled Tree Snake

LC – Least Concern (Regional)

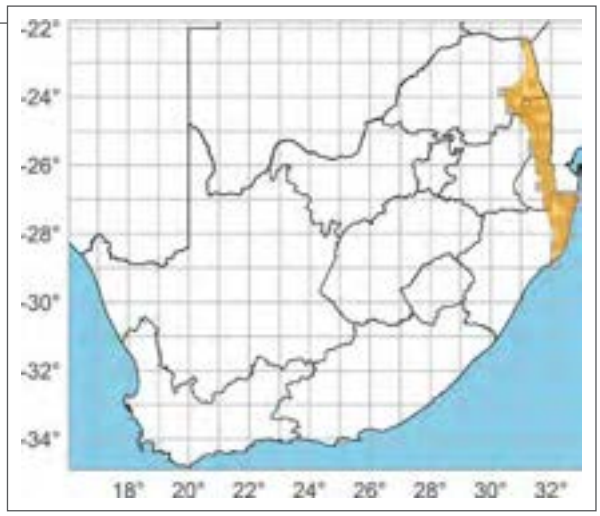
Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Has a moderate-sized distribution within South Africa and Eswatini, is abundant, and mostly occurs within protected areas.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: From northeastern KwaZulu-Natal province through Eswatini and eastern Mpumalanga province into eastern Limpopo province, and northwards to central Mozambique and southern Malawi (Rasmussen 1989). The isolated record from Tanzania (Rasmussen 1989) is believed to be a misidentification. *EOO*: 82 000 km^2; *Distribution*: 47 200 km^2.



Countries of occurrence: Eswatini, Malawi, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Occurs in lowland Riverine Forest and Moist Savanna from near sea level to at least 650 m a.s.l. (Broadley & Stevens 1971). Shelters in hollow logs, under bark and in thatched roofs. *Habitat*: Forest, Savanna.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread and fairly common species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.

Dipsadoboa aulica, Kosi Bay, KwaZulu-Natal province (© D.W. Pietersen).

Dipsadoboa aulica, Hluhluwe, KwaZulu-Natal province (© L. Verburgt).

Family **Colubridae**

Dispholidus typus (Smith, 1828)

Boomslang

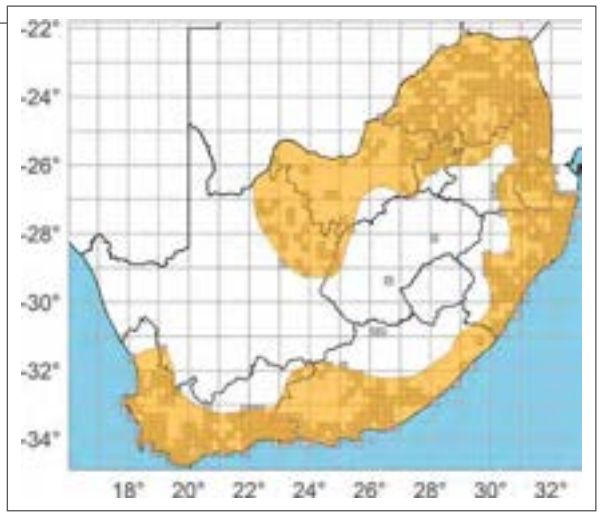
LC – Least Concern (Regional)

Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no substantial threats.

Taxonomic notes: Currently four subspecies of *D. typus* are recognised (*D. t. typus*, *D. t. viridis*, *D. t. kivuensis*, *D. t. punctatus*). However, a preliminary phylogenetic analysis shows there are most likely several distinct species (Eimermacher 2012), but the geographic divide between these is uncertain. Broadley and Blaylock (2013) considered populations in (mainly) the Western and Eastern Cape provinces as being referable to *D. t. typus*, while populations elsewhere in the range (where males are usually mainly green dorsally) were treated as *D. t. viridis*. *Other important names*: *Dispholidus typus typus*; *Dispholidus t. viridis*; *D. t. kivuensis*; *D. t. punctatus*.



Distribution: Widespread across most of sub-Saharan Africa. It occurs throughout the southern, eastern and north-central parts of South Africa and Eswatini (Branch 1998). Largely absent from much of the drier western parts of South Africa, and not found on the

Dispholidus typus viridis, male colouration, Hluhluwe, KwaZulu-Natal province (© T. Ping).

Dispholidus typus typus, Makhanda, Eastern Cape province (© C. Keates).

Dispholidus typus typus, juvenile colouration, Makhanda, Eastern Cape province (© C. Keates).

grassy plains of the central Highveld or in Lesotho. *EOO*: 1 262 000 km^2; *Distribution*: 621 000 km^2.

Countries of occurrence: Angola, Benin, Botswana, Cameroon, Central African Republic, Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Nigeria, Rwanda, Senegal, Somalia, South Africa, Tanzania, Uganda, Togo, Zambia, Zimbabwe.

Habitat and ecology: Largely arboreal in a variety of habitats including Karoo Scrub, Arid Savanna, Moist Savanna, Lowland Forest, Grassland and Fynbos (Marais 2004). Often observed moving over open ground, but quickly takes refuge in trees and bushes (Jacobsen 1989), underground or under cover. *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread and common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: Phylogenetic and morphological analysis of the various subspecies of *D. typus* is required.

Dispholidus typus viridis, female colouration, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Family **Colubridae**

Meizodon semiornatus (Peters, 1854)

Semiornate Snake

LC – Least Concern (Regional)

Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Meizodon semiornatus semiornatus* – Least Concern (SARCA).

Assessment rationale: Although this snake has a restricted distribution in South Africa and Eswatini, it is fairly widespread elsewhere. In Eswatini it is considered Near Threatened (Monadjem et al. 2003), but regionally it is assessed as Least Concern.

Taxonomic notes: Two subspecies are recognised: *M. s. semiornatus* and *M. s. tchadensis*, the latter from Sudan and Chad (Branch 1998). *Other important names*: none.

Distribution: Widespread in sub-Saharan Africa, from South Africa northward to Somalia, westward to Chad and Cameroon (Broadley 1990a; Spawls et al. 2018; Chippaux & Jackson 2019). Regionally it occurs from northeastern KwaZulu-Natal province, through Eswatini to eastern Mpumalanga province and northeastern Limpopo province (Branch 1998; Swanepoel 2010). *EOO*: 51 000 km²; *Distribution*: 21 000 km².

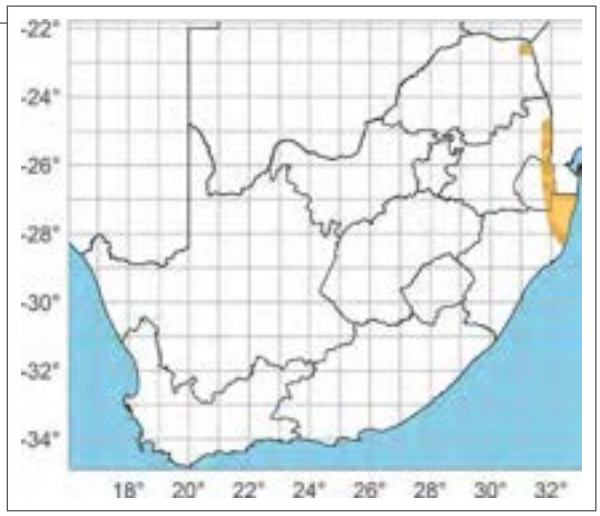
Countries of occurrence: Botswana, Cameroon, Chad, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Somalia, South Africa, Sudan, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Found in a wide range of habitats including Woodlands, Arid and Mesic Savanna and marshy areas (Jacobsen 1989; Broadley 1990a; Spawls et al. 2018). *Habitat*: Savanna.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread species, which, in the region, occurs mainly in well-protected areas. The extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.



Meizodon semiornatus, northeastern Mozambique (© W. Conradie).

Meizodon semiornatus, Kruger National Park, Limpopo province (© C. Keates).

Family **Colubridae**

Philothamnus angolensis Bocage, 1882

Angolan Green Snake

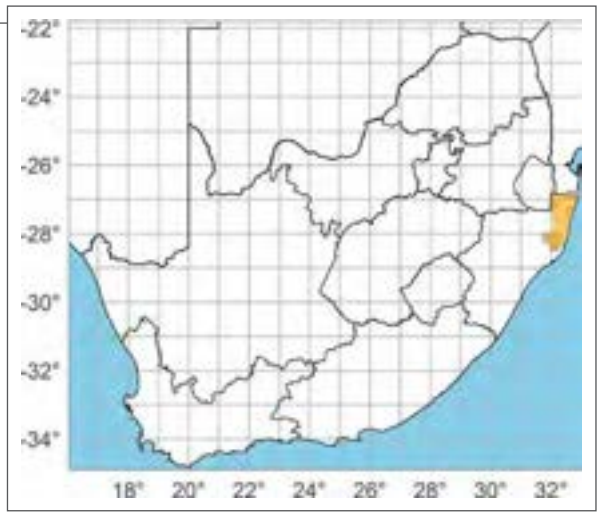
NT – Near Threatened A2c+B1b(i,iii,iv,v) (Regional)

Assessors: Alexander, G.J., Pietersen, D.W., Conradie, W., Tolley, K.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Reason for recent change: Genuine.

Assessment rationale: Has a small range within the region but is widespread elsewhere. This species has only been recorded a few times in South Africa since the early 1990s from areas that are otherwise well surveyed. There has been significant land transformation within its range, although some of the inferred range includes protected areas. The scarcity of records suggests that the population and the EOO may be in decline regionally. There is no evidence to suggest that significant immigration is occurring from outside the region. Therefore, the regional status has not been down-weighted by taking immigration from the global population into account. Regionally assessed as Least Concern in 2014 because the lack of recent records in South Africa had been overlooked.



Taxonomic notes: There has been confusion over the taxonomy of *P. angolensis* relative to *P. irregularis*. However, *P. irregularis* only occurs in west and central Africa, and Angolan records attributed to *P. irregularis* are now assigned to *P. angolensis* (see Branch 2018). *Other important names*: none.

Distribution: Widespread in sub-Saharan Africa, from South Africa northwards to Tanzania, into central and west-central Africa (Broadley 1990a; Chippaux & Jackson 2019). There are no records from Gabon (Pauwels & Vande Weghe 2008), but it does occur in neighbouring countries. Regionally, it has been recorded from

Philothamnus angolensis, Kosi Bay, KwaZulu-Natal province (© K. Kyle).

Family **Colubridae**

Philothamnus angolensis, west of Menongue, Angola (© L. Verburgt).

northeastern KwaZulu-Natal province, South Africa, where it is presumed to have a patchy distribution, with records from Hluhluwe Nature Reserve, the Sibaya area, Mangusi Forest near Kosi Bay and the lower slopes of the Lebombo Mountains. The regional interpreted distribution and EOO have been estimated by including both recent and historical records but is now likely to be significantly reduced. *EOO*: 12 750 km^2; *Distribution*: 10 750 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Cameroon, Central African Republic, Democratic Republic of the Congo, Malawi, Mozambique, Namibia, Republic of the Congo, Rwanda, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a range of vegetation types from near sea level to about 2 000 m a.s.l. and is usually associated with waterbodies (Broadley 1990a; Marais 2004; Spawls et al. 2018). *Habitat*: Forest, Savanna.

Threats: Significant land transformation has occurred in northern KwaZulu-Natal province, which may affect the population, although parts of the historical range would have been within protected areas.

Population trend: This snake has not been recorded in South Africa since 1992, and this likely represents a regional population decline.

Conservation and research recommendations: Targeted surveys to ascertain whether this species still occurs in South Africa would be beneficial, as would estimates of the population abundance and the species' range in South Africa.

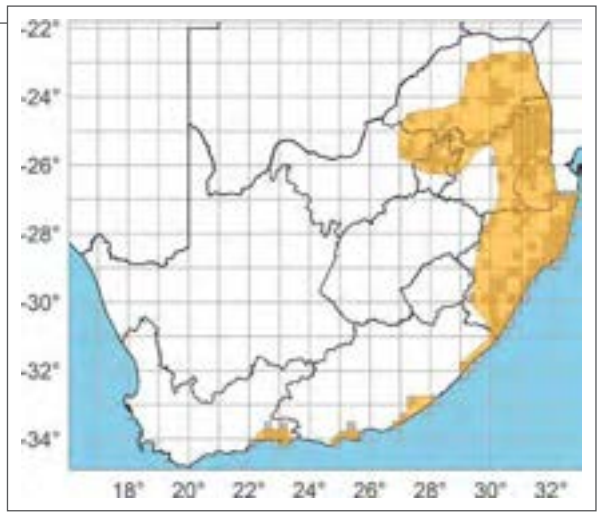
Family **Colubridae**

Philothamnus hoplogaster (Günther, 1863)

South-eastern Green Snake

LC – Least Concern (Regional)

Assessors: Marais, J., Turner, A.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no substantial threats.

Taxonomic notes: No notable taxonomic issues. *Other important names*: none.

Distribution: Widespread in sub-Saharan Africa, from northern and eastern South Africa (including Eswatini), northwards to South Sudan and west to Cameroon (Broadley 1990a; Spawls et al. 2018; Chippaux & Jackson 2019). There are three apparently isolated populations along the South African south coast in the Eastern and Western Cape province. Individuals have been accidentally introduced into the Western Cape province in the vicinity of Cape Town, but these populations failed to establish and are believed to have died out. *EOO*: 710 000 km^2; *Distribution*: 257 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Cameroon, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a variety of habitats including Savanna, Woodland and Lowland Forest, usually near water. It is an excellent swimmer (Branch 1998) and climbs well (Marais 2004). *Habitat*: Forest, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.

Philothamnus hoplogaster, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Family **Colubridae**

Philothamnus natalensis (Smith, 1848)

Natal Green Snake

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Marais, J., Turner, A.A.

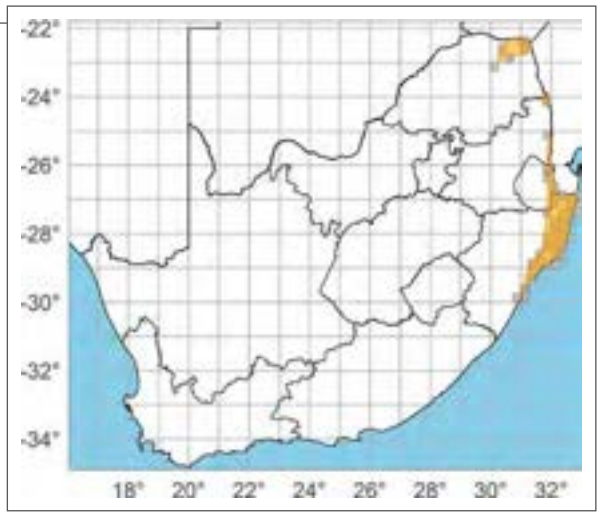
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern as *Philothamnus natalensis natalensis* (SARCA).

Assessment rationale: Widespread and relatively common with no known substantial threats at present.

Taxonomic notes: Alexander (1987) suggested that the subspecies *P. n. natalensis* and *P. n. occidentalis* should both be considered full species on the basis of morphological and behavioural differences. This has been supported by a subsequent phylogenetic analysis, where *P. occidentalis* was formally elevated to a full species rendering *P. natalensis* monotypic (Engelbrecht et al. 2019). *Other important names*: *Philothamnus natalensis natalensis*.

Distribution: Occurs in the eastern parts of southern Africa, from eastern Mpumalanga, Limpopo and KwaZulu-Natal provinces in South Africa, through eastern Eswatini into southern Mozambique and eastern Zimbabwe (Broadley 1990a; Marais 2004). *EOO*: 134 000 km²; *Distribution*: 29 600 km².

Countries of occurrence: Eswatini, Mozambique, South Africa, Zimbabwe.



Habitat and ecology: Inhabits mainly Lowland Forest and Savanna, often along forested river valleys, and is an excellent climber (Marais 2004). *Habitat*: Forest, Savanna.

Threats: At present, there are no known substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species, and the extent of habitat transformation is small in relation to the large geographic range.

Conservation and research recommendations: No recommendations.

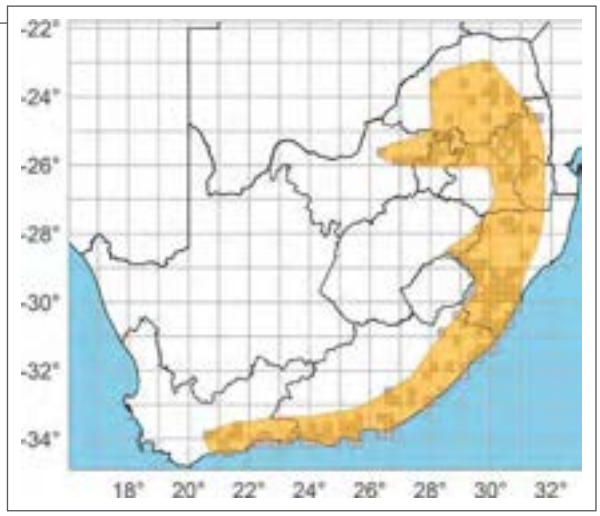
Philothamnus natalensis, Hluhluwe, KwaZulu-Natal province (© L. Verburgt).

Philothamnus natalensis, Xai-Xai, Mozambique (© C.R. Hundermark).

Family **Colubridae**

Philothamnus occidentalis Broadley, 1966

South African Green Snake



Regional endemic

LC – Least Concern (Global)

Assessors: Tolley, K.A., Marais, J.

Previous Red List categories:

2019: Least Concern (Global IUCN assessment).
2018: Least Concern as *Philothamnus natalensis occidentalis* (Global IUCN assessment).
2017: Least Concern as *Philothamnus natalensis occidentalis* (Global IUCN assessment).
2014: Least Concern as *Philothamnus natalensis occidentalis* (SARCA).

Assessment rationale: Widespread and relatively common with no major threats.

Taxonomic notes: Alexander (1987) suggested that the subspecies *P. natalensis occidentalis* be elevated to full species status based on morphological and behavioural differences between it and *P. n. natalensis*. This has been confirmed by a phylogenetic analysis (Engelbrecht et al. 2019). It is easily confused with *P. natalensis* and *P. hoplogaster* because of superficial similarities in general appearance and behaviour. *Other important names*: *Philothamnus natalensis occidentalis*.

Philothamnus occidentalis, Fort Fordyce Nature Reserve, Eastern Cape province (© W. Conradie).

Family **Colubridae**

Philothamnus occidentalis, Silaka Nature Reserve, Eastern Cape province (© W. Conradie).

Philothamnus occidentalis, Buffelskloof Private Nature Reserve, Mpumalanga province (© L. Verburgt).

Distribution: Occurs widely across most of southern and eastern South Africa, including western Eswatini, and extending westward into western North West province. *EOO*: 751 000 km^2; *Distribution*: 313 000 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Occurs in Lowland and Montane Forests, Wooded Grassland and Forest Edges (Bourquin 2004; Marais 2004). Frequents trees and shrubs near water, at elevations as high as 2 000 m a.s.l. (Jacobsen 1989). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: No major threats to this widespread snake.

Population trend: Although there has been a reduction in habitat quality in some parts of its range, the species is locally common and tolerates transformation of habitats to an extent. The population is thus unlikely to have declined significantly.

Conservation and research recommendations: No recommendations.

Family **Colubridae**

Philothamnus semivariegatus (Smith, 1840)

Spotted Bush Snake

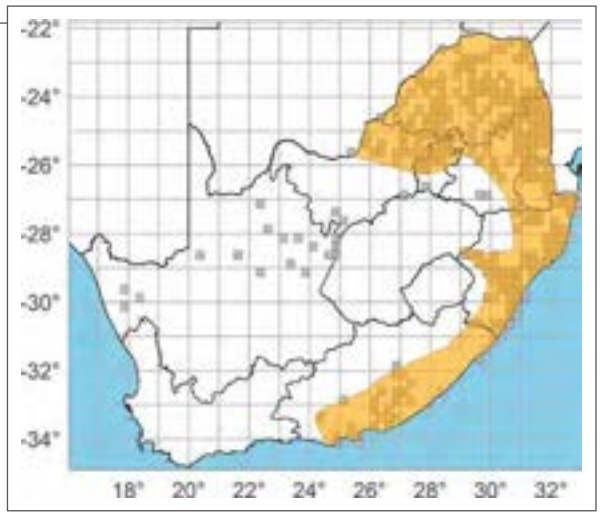
LC – Least Concern (Regional)

Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, with no known significant threats. Individuals can tolerate moderate levels of habitat transformation.

Taxonomic notes: A recent phylogenetic study suggests that *P. semivariegatus* is paraphyletic, containing four distinct clades, which are thought to represent up to four cryptic species (Engelbrecht et al. 2019). The four clades are delineated along broad geographic lines: central Africa, southeastern Africa, northeastern South Africa, and central-northern South Africa. This study did not include material from the type locality of *P. semivariegatus* nor material from West Africa and was thus unable to assign the name-bearing clade. On this basis Engelbrecht et al. (2019) refrained from making any taxonomic recommendations pending a full revision of this species complex. *Other important names*: none.



Distribution: Widely distributed in sub-Saharan Africa, from West Africa (Senegal) eastwards to South Sudan and southwards to South Africa but absent from Gabon and peripheral to the Congo basin of the Democratic Republic of the Congo (Chippaux & Jackson 2019). Widely distributed in the eastern half of South Africa, extending into the southern coastal regions. It extends into the more arid central and western portions of South Africa along major rivers and their tributaries (especially the Orange and Vaal rivers), with a potentially disjunct subpopulation

Philothamnus semivariegatus, Blouberg, Limpopo province (© R.I. Stander).

Family **Colubridae**

Philothamnus semivariegatus, Soutpansberg, Limpopo province (© M. Petford).

Philothamnus semivariegatus, Makhanda, Eastern Cape province (© C. Keates).

in Namaqualand (Engelbrecht et al. 2019). *EOO*: 1 135 000 km^2; *Distribution*: 379 000 km^2.

Countries of occurrence: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Eswatini, Ethiopia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, Senegal, Sierra Leone, South Africa, South Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Inhabits Savanna, Lowland Forest and riverbanks, as well as shrubby vegetation and rocky regions. It is an excellent climber and forages in shrubs and bushes (Branch 1998; Marais 2004). Occupies crevices in rock outcrops, holes in trees and large, old termitaria, and is also found under tree bark, at elevations as high as 2 000 m a.s.l. (Jacobsen 1989). *Habitat*: Forest, Savanna, Shrubland.

Threats: There are no substantial threats to this species at present.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: Further analyses are required to assess the taxonomy of the paraphyletic populations present in South Africa.

Telescopus beetzi (Barbour, 1922)

Namib Tiger Snake

LC – Least Concern (Regional)

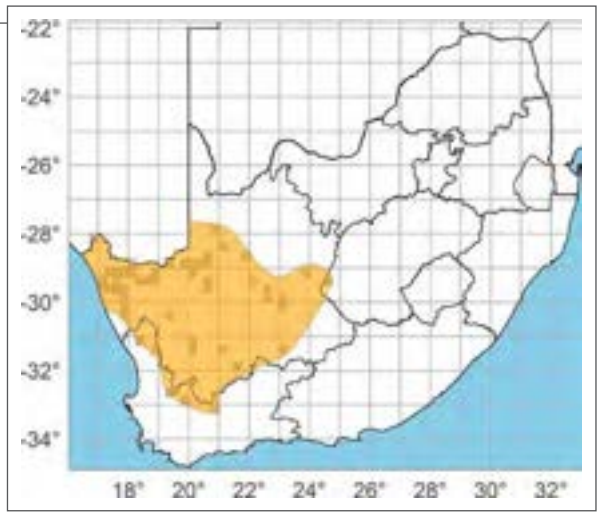
Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread with no substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Widespread in central and western South Africa, from Northern Cape province, marginally entering the northern Western Cape province and extreme western Free State province, extending northwards to central Namibia. *EOO*: 314 000 km²; *Distribution*: 256 000 km².



Countries of occurrence: Namibia, South Africa.

Habitat and ecology: Occurs in arid regions where it lives in rocky outcrops, sheltering in crevices (Branch 1998). It has also been found in moribund termite mounds (De Waal 1978). *Habitat*: Shrubland.

Threats: There are no substantial threats to this species.

Population trend: Although this species is not commonly encountered, much of its range is in areas that are not heavily impacted. The population is therefore considered to be stable.

Conservation and research recommendations: No recommendations.

Telescopus beetzi, Garies, Northern Cape province (© C.R. Hundermark).

Telescopus beetzi, Port Nolloth, Northern Cape province (© R.I. Stander).

Family **Colubridae**

Telescopus semiannulatus Smith, 1849

Common Tiger Snake

LC – Least Concern (Regional)

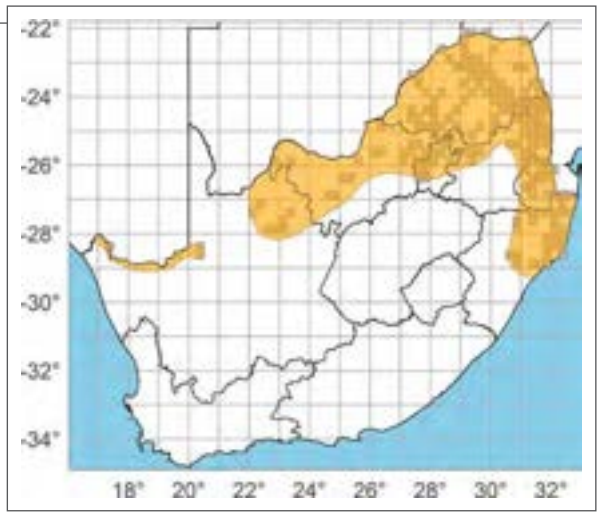
Assessors: Marais, J., Turner, A.A.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Telescopus semiannulatus semiannulatus* – Least Concern (SARCA).
2014: *Telescopus semiannulatus polystictus* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Telescopus semiannulatus semiannulatus* Smith, 1849.
- *Telescopus semiannulatus polystictus* Mertens, 1954.

Assessment rationale: Widespread and common with no significant threats.



Taxonomic notes: There are currently two recognised subspecies, namely *T. s. semiannulatus* and *T. s. polystictus*. *Other important names*: none.

Distribution: Occurs across much of sub-Saharan Africa, from South Africa and Eswatini northwards to Namibia in the west and the Democratic Republic of

Telescopus semiannulatus semiannulatus, Pafuri, Kruger National Park, Limpopo province (© C. Keates).

the Congo and Kenya in the east (Broadley 1990a; Branch 1998). In South Africa it occurs from northern KwaZulu-Natal province, extending north to Limpopo province and westwards to the northeastern parts of the Northern Cape province. Historical records (Broadley 1990a) from near the western border of the Free State province are considered dubious. *EOO*: 783 000 km^2; *Distribution*: 354 000 km^2.

Countries of occurrence: Botswana, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Tanzania, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Found in Arid and Moist Savanna and Lowland Forest, where it shelters under bark, loose flakes of rock and in rock crevices (Marais 2004). It also frequently climbs trees (Broadley 1990a). *Habitat*: Forest, Savanna.

Threats: There are no significant threats. *Use and trade*: Although this species is sometimes available in the pet trade, this is unlikely to be a significant threat.

Population trend: The population size is assumed to be stable because this is a widespread and common species with portions of the range that are not significantly impacted by habitat transformation.

Telescopus semiannulatus polystictus, Brandberg, Namibia (© C. & S. Dorse).

Conservation and research recommendations: A taxonomic evaluation of the validity of the two subspecies is needed.

Family **Colubridae**

Thelotornis capensis Smith, 1849

Southern Twig Snake

LC – Least Concern (Regional)

Assessors: Turner, A.A., Marais, J.

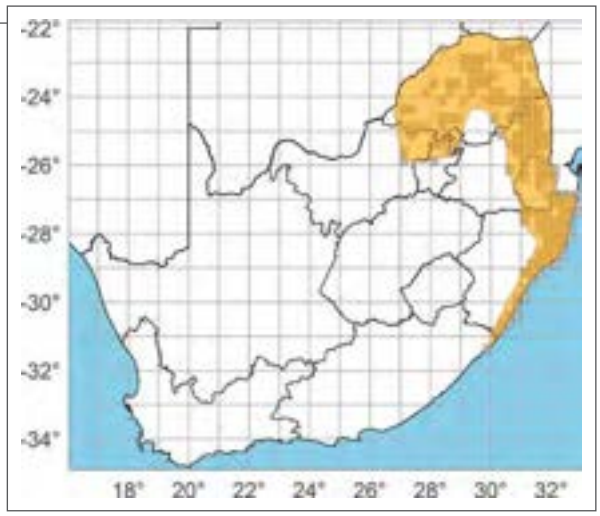
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2011: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Thelotornis capensis capensis* – Least Concern (SARCA).

Assessment rationale: Widespread and common with no significant threats.

Taxonomic notes: Two subspecies are recognised, namely *T. c. capensis* and *T. c. oatesii*. *Other important names*: none.

Distribution: Occurs across most of southern Africa, absent only from the most arid western areas. In the region, it enters South Africa in the northeast and extends southwards into Eswatini and westwards to the North West province. Southwards, the distribution narrows along the eastern coastal margin, reaching as far south as the Eastern Cape province at Mkambati Nature Reserve (Broadley 2001b). *EOO*: 389 000 km²; *Distribution*: 212 000 km².



Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Eswatini, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Inhabits trees and shrubs in various vegetation types (Broadley 1990a; Branch 1998). *Habitat*: Forest, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The widespread range and abundance of this species mitigates against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Thelotornis capensis capensis, Goro, Limpopo province (© R.I. Stander).

Aspidelaps lubricus (Laurenti, 1768)

Cape Coral Snake

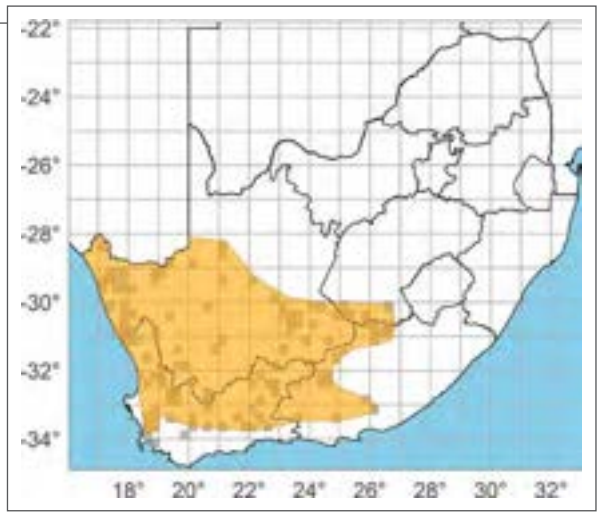
LC – Least Concern (Regional)

Assessor: Alexander, G.J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Aspidelaps lubricus lubricus* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Aspidelaps lubricus lubricus* (Laurenti, 1768).
- *Aspidelaps lubricus cowlesi* Bogert, 1940.



Assessment rationale: Widespread and common, with no known substantial threats.

Taxonomic notes: Although three subspecies have been described (*A. l. lubricus*, *A. l. cowlesi* and *A. l. infuscatus*), *A. l. infuscatus* Mertens, 1954 from Namibia was referred to the synonymy of *A. lubricus cowlesi* from western Namibia and southwestern Angola (Broadley & Baldwin 2006). The validity of these subspecies has not been investigated in a

Aspidelaps lubricus lubricus, Springbok, Northern Cape province (© M. Petford).

Family **Elapidae**

Aspidelaps lubricus lubricus, Strandfontein, Western Cape province (© M. Lundberg).

phylogenetic framework. *Other important names*: *Aspidelaps lubricus infuscatus*.

Distribution: Occurs from southern Angola southwards through Namibia to the western parts of South Africa (Broadley & Baldwin 2006). In South Africa it is widespread in the Northern and Western Cape provinces, the western half of the Eastern Cape province, and the southern Free State province. The subspecies *A. l. lubricus* occurs in South Africa and southwestern Namibia, whereas *A. l. cowlesi* occurs in southern Angola and western Namibia, south to Lüderitz (Broadley & Baldwin 2006). Historical records from the Gqeberha region and south of the Cape Fold Mountains are thought to be erroneous. *EOO*: 487 000 km^2; *Distribution*: 384 000 km^2.

Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: Occurs in rock outcrops, stony and dry sandy regions (Marais 2004) and arid plains in valleys (Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: Collection for the pet trade is a known threat but is probably of limited extent. *Use and trade*: This snake is sought after in the pet trade due to its bright colouration and individuals are widely available in the trade. Illegal export of wild-caught individuals might be common (Broadley & Baldwin 2006).

Population trend: Because this snake mainly occurs in arid regions that have not been significantly impacted by habitat transformation, the population size is not thought to have declined significantly.

Conservation and research recommendations: The taxonomy of the remaining subspecies should be investigated.

Family **Elapidae**

Aspidelaps scutatus (Smith, 1849)

Speckled Shield Cobra

LC – Least Concern (Regional)

Assessor: Alexander, G.J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

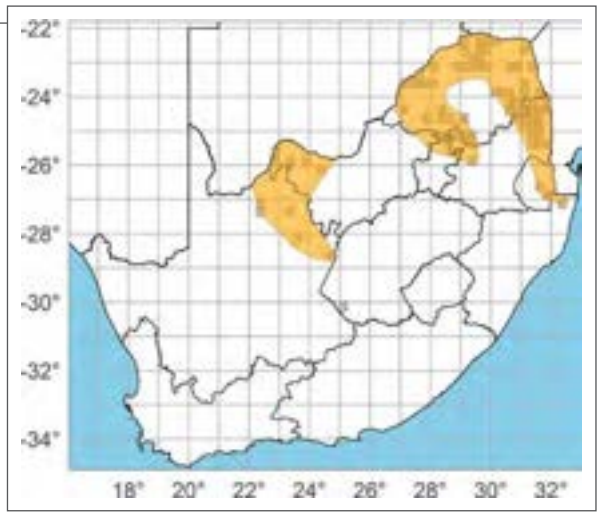
Subspecies assessed:
2014: *Aspidelaps scutatus scutatus* – Least Concern (SARCA).
2014: *Aspidelaps scutatus intermedius* – Least Concern (SARCA).

Subspecies included under this assessment:
- *Aspidelaps scutatus fulafula* (Bianconi, 1849).
- *Aspidelaps scutatus intermedius* Broadley, 1968.
- *Aspidelaps scutatus scutatus* (Smith, 1848).

Assessment rationale: Widespread and relatively common across its range, with no major threats.

Taxonomic notes: Three subspecies are recognised, namely *A. s. scutatus*, *A. s. intermedius* and *A. s. fulafula*. According to Broadley and Baldwin (2006), the latter two subspecies may together represent a single species (*A. s. fulafula* is the older name) separate from *A. s. scutatus*. It is unclear whether the distributions of the subspecies are allopatric, and a phylogenetic analysis is needed to verify if there is any subspecies or species-level structure. *Other important names*: none.

Distribution: Widespread across southern Africa. In South Africa, it occurs in the northern parts, from western North West province, across Limpopo province and into northern Mpumalanga and Gauteng provinces. It has also recently been reported from the northern extremes of KwaZulu-Natal province as *A. s. fulafula* (Reissig et al. 2015). *EOO*: 579 000 km^2; *Distribution*: 194 000 km^2.



Countries of occurrence: Botswana, Eswatini, Mozambique, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Semi-fossorial and nocturnal (Marais 2004), occurring at elevations of 90–1 400 m a.s.l. (Jacobsen 1989; Boycott 1992a). May take refuge in rodent burrows by day (Broadley & Baldwin 2006). *Habitat*: Grassland, Savanna.

Threats: There are no major threats to this species.

Population trend: The widespread range and abundance mitigate against the negative effects of local population declines.

Conservation and research recommendations: No recommendations.

Aspidelaps scutatus intermedius, Hoedspruit, Limpopo province (© D. Maguire).

Aspidelaps scutatus scutatus, Soutpansberg, Limpopo province (© R. van Huyssteen).

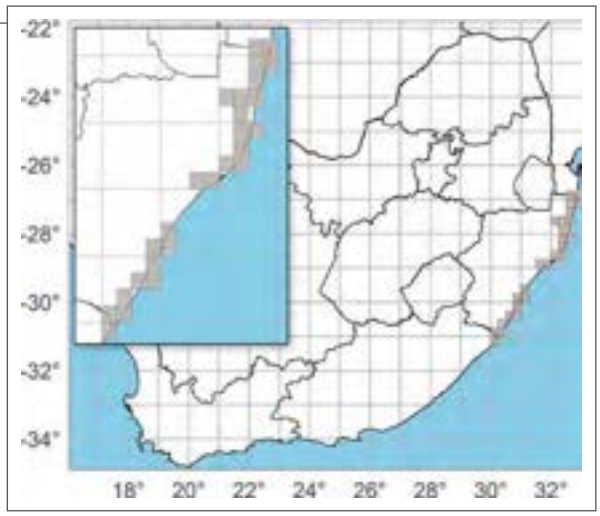
Family **Elapidae**

Dendroaspis angusticeps (Smith, 1849)

Green Mamba

VU – Vulnerable B2ab(ii,iii,iv,v) (Regional)

Assessors: Alexander, G.J., Tolley, K.A., Weeber, J., Pietersen, D.W., Conradie, W.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Vulnerable (SARCA).

Assessment rationale: In South Africa, this species has a small range that is severely fragmented and is undergoing further reduction in quality and extent. The coastal forest habitat to which it is restricted is highly threatened (Mucina & Rutherford 2006). The AOO and number of subpopulations is decreasing as fragments of forest are transformed and lost. The AOO is estimated to have reduced from a historical level of 2 228 km^2 to ± 2 104 km^2 in 1990 and 1 750 km^2 at present. This is also likely to result in a reduction in the number of mature individuals and viability of several subpopulations. About 60% of the South African range falls within the iSimangaliso Wetland Park and World Heritage Site, where there is an emerging threat of socioeconomically driven land invasion into the protected area by local communities, and this should be monitored. If this threat becomes active and given the relatively small EOO, much of which falls within the protected area, this species could rapidly decline. Due to the extreme habitat fragmentation, it is unlikely that the regional population would be significantly enhanced by immigration from outside the region. Therefore, the regional status was not amended by taking the global population into account.

Taxonomic notes: Populations from the southern part of the range (South Africa and southern Mozambique) differ genetically from Tanzanian specimens (Pook et al. 2005). Because *D. angusticeps* was described from specimens collected from KwaZulu-Natal province and Maputo (Mozambique), northern populations may require a new specific rank if genetic differences are found to be at the species level. Some authors informally treat northern populations as *D. intermedius* (Broadley & Blaylock 2013; Wallach et al. 2014). However, further work is required within a phylogenetic framework, as is additional sampling that covers

Dendroaspis angusticeps, Scottburgh, KwaZulu-Natal province (© T. Ping).

the range of both northern and southern populations. *Other important names*: *Dendroaspis intermedius*.

Distribution: From coastal Kenya southwards and westwards into Tanzania, Mozambique and South Africa (Spawls et al. 2018). In South Africa, it is restricted to small patches of low elevation forests along the KwaZulu-Natal province coastline. Alexander (1990) reports that it is not found more than 2 km from the sea in Durban, but recent records reveal an isolated population in a forest patch in Queensburgh, nearly 15 km from the coast (N. Evans, pers. comm. 2019). Historical records from the extreme northeastern parts of the Eastern Cape province (Broadley 1990a; Alexander & Marais 2007) have not been reconfirmed in several decades and the AOO has declined from a historical level of just over 2 200 km² to 1 750 km². This ongoing loss is apparent from the South African National Land Cover Datasets from 1990 and 2013 (Geo Terra Image 2015, 2016). Comparison of these land cover data show there is ± 7% natural land cover loss within the distribution of this species in this 23-year time period. This is much greater than the national average of 2.3% decrease of natural land cover nationally during the same time period. *EOO*: 21 490 km²; *AOO*: 1 750 km²; *Distribution*: 520 km².

Countries of occurrence: Kenya, Malawi, Mozambique, South Africa, Tanzania, Zimbabwe.

Habitat and ecology: Strictly arboreal and restricted to forest, occurring from sea level to 200 m a.s.l. (Bourquin 2004). *Habitat*: Forest.

Threats: A strict habitat specialist that is restricted to Northern Coastal Forest and Swamp Forest, both of which have been reduced in extent in South Africa and are undergoing further anthropogenic transformation (Mucina & Rutherford 2006). The range is highly fragmented and is becoming more so through land transformation (e.g., coastal housing developments, small- and large-scale agriculture, commercialised afforestation of exotic species and strip mining). A large portion of the South African range (approximately 60%) falls within the iSimangaliso Wetland Park and World Heritage Site, but despite the official protection status, the park has become vulnerable to the threat of socioeconomically driven land invasion by local communities. Given that other protected areas in South Africa recently have been de-gazetted due to land invasions in favour of informal human settlement (e.g., Western Cape Government 2022), this is a plausible emerging threat. The species is also openly sold on the internet, but the detrimental effects of removals from the wild for trade are not known. *Use and trade*: None of the *Dendroaspis* species are CITES listed, and thus international trade statistics are not available. *Dendroaspis angusticeps* is listed on the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004): List of Terrestrial and Fresh Water Species that are Threatened or Protected, Restricted Activities that are Prohibited, and Restricted Activities that are Exempted (ToPS List). This listing on ToPS prohibits removal from the wild in South Africa. The species is, however, common in the pet trade (Auliya et al. 2016) and can be found in traditional medicine markets in Mozambique and South Africa (Williams & Whiting 2016). Wild-caught individuals originating from South Africa, if in trade, would likely have been acquired illegally given the ToPS regulations.

Population trend: Although this species may occur at high densities in Kenya and Tanzania (Branch 1998), population densities appear to be much lower in South Africa. Many of the forest habitat patches in South Africa have been transformed, resulting in a reduction in the size and number. These patches average about 38 km² in size. The largest remaining habitat fragment in South Africa is 136 km² in area. Many of the patches, especially those in proximity to urban areas, become more isolated by transformation of intervening land and are thought to no longer be suitable to sustain viable subpopulations. The population is therefore considered severely fragmented and in decline due to the loss of habitat resulting in a decrease in AOO.

Conservation and research recommendations: *Dendroaspis angusticeps* is protected from trade by the South African Threatened or Protected Species Regulations of 2015, and much of its remaining habitat is under formal protection (Tolley et al. 2019a). Nevertheless, there is an emerging threat of socioeconomically driven land invasion by local communities within the protected area that covers a large portion of this species' distribution. Associated changes in land use and potential rapid habitat destruction will require careful monitoring. Outside protected areas, densities of subpopulations should be measured and monitored to better understand the effects of habitat loss on population declines. Although the population in southern Mozambique is probably connected with those in South Africa, other localities in the northern part of the species' range are not considered to be contiguous with the Mozambique–South Africa population. A better knowledge of the distribution and a phylogenetic study would be useful for future assessments.

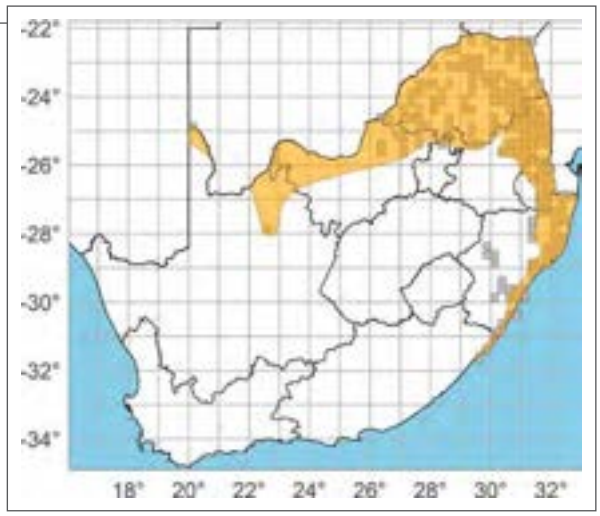
Family **Elapidae**

Dendroaspis polylepis Günther, 1864

Black Mamba

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread but occurring at naturally low densities (Jacobsen 1989). The species is considered Least Concern in light of its large distribution and records suggesting that it is extending its distribution southwards (Maritz & Alexander 2010). While some of the area is impacted by habitat transformation, most of the range is relatively intact and the species is considered well protected as it is found in ± 70 large, protected areas.

Taxonomic notes: No notable taxonomic issues. *Other important names*: none.

Distribution: Occurs from Senegal eastwards to Somalia, southwards into Eswatini and South Africa, and west to Namibia and Angola (Jacobsen 1989) but absent from the equatorial forests of West and central Africa (Broadley 1990a), and the records in West Africa are scattered and widely separated from those in the main part of the distribution to the east. In South Africa it occurs in coastal regions in the extreme northern Eastern Cape province, through much of the northern portions of South Africa to the northern portions of the Northern Cape province. The isolated inland records in KwaZulu-Natal province are historical and although the habitat appears suitable, this species' continued presence here requires confirmation. Recent records from central and southern Gauteng province are believed to represent stowaways. *EOO*: 827 000 km²; *Distribution*: 270 000 km².

Countries of occurrence: Angola, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic,

Dendroaspis polylepis, Hoedspruit, Limpopo province (© W. Wüster).

Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Eswatini, Ethiopia, Guinea, Kenya, Malawi, Mozambique, Namibia, The Gambia, Rwanda, Senegal, Somalia, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Uses a wide variety of habitat types, especially rocky hillsides and outcrops (Jacobsen 1989). Shelters in rock crevices, old termitaria and hollow logs (Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species. *Use and trade*: This species is frequently sold in the *muthi* (traditional medicine) trade (Williams et al. 2016).

Population trend: The extent of habitat transformation is small in relation to the large range of this species. It is thus assumed that any local population declines do not pose a risk to this snake. In some areas (e.g., KwaZulu-Natal province) frequent sightings suggest the population could be increasing in either range or abundance.

Conservation and research recommendations: The taxonomic status of the disjunct West African subpopulations should be investigated.

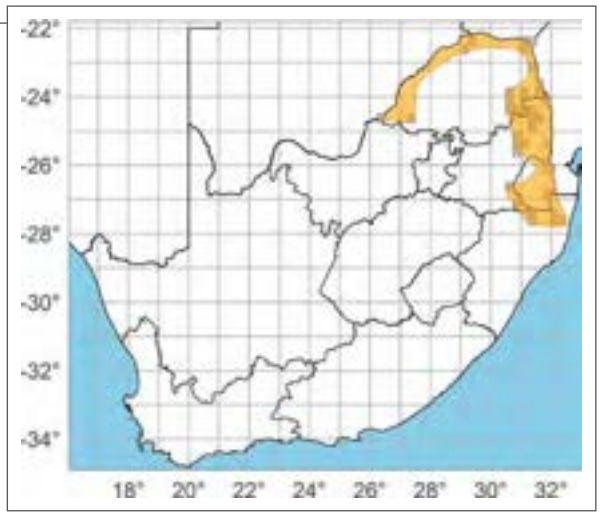
Family **Elapidae**

Elapsoidea boulengeri Boettger, 1895

Boulenger's Garter Snake

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread but rarely recorded (Jacobsen 1989). Despite the apparent rarity, the population is not considered to be declining and much of the distribution is in areas that are not heavily impacted by habitat transformation.

Taxonomic notes: The taxonomy of *Elapsoidea* has had a complicated history, with most species and subspecies defined on colouration without any clear morphological differences. *Other important names*: none.

Distribution: Occurs across southeastern Africa, from Tanzania south to the northeastern parts of South Africa (Broadley 1971a). Regionally, it is restricted to the northern parts of KwaZulu-Natal province, eastern Mpumalanga and Limpopo provinces, South Africa, extending into Eswatini. *EOO*: 235 000 km^2; *Distribution*: 85 000 km^2.

Countries of occurrence: Botswana, Eswatini, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in mesic habitats, often associated with open floodplains (Broadley 1971a).

Elapsoidea boulengeri, Cleveland Nature Reserve, Limpopo province (© M. Burger).

Elapsoidea boulengeri, captive specimen from unknown locality (© G. Alexander).

Elapsoidea boulengeri, Hoedspruit, Limpopo province (© L. Verburgt).

Shelters under rocks and rotting logs (Jacobsen 1989). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: The extent of habitat transformation is small in relation to the large range of this species. It is thus assumed that any local population declines do not pose a conservation threat.

Conservation and research recommendations: The validity of the various *Elapsoidea* taxa should be assessed in a phylogenetic framework.

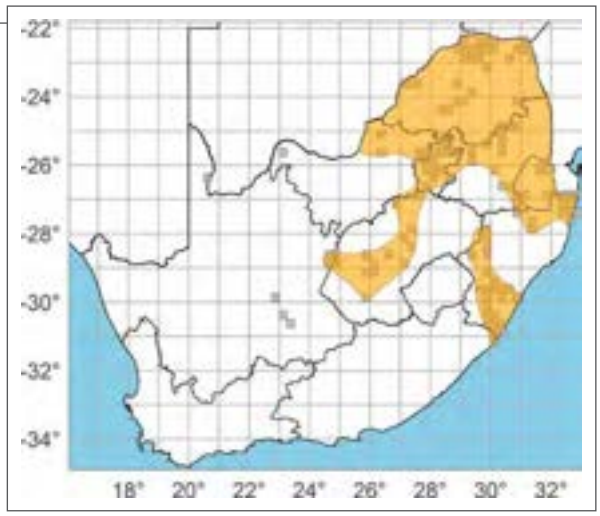
Family **Elapidae**

Elapsoidea sundevallii (Smith, 1848)

Sundevall's Garter Snake

LC – Least Concern (Regional)

Assessor: Alexander, G.J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Subspecies included under this assessment:
- *Elapsoidea sundevallii decosteri* Boulenger, 1888.
- *Elapsoidea sundevallii fitzsimonsi* Loveridge, 1944.
- *Elapsoidea sundevallii longicauda* Broadley, 1971.
- *Elapsoidea sundevallii media* Broadley, 1971.
- *Elapsoidea sundevallii sundevallii* (Smith, 1848).

Assessment rationale: Although rarely encountered, this snake has a large distribution, much of which is not heavily impacted by habitat loss.

Taxonomic notes: The subspecies of *E. sundevallii* have overlapping morphological characters making them difficult to distinguish, calling into question their validity (Tolley et al. 2020). Preliminary unpublished phylogenetic results suggest that although the nominate subspecies *E. s. sundevalli* is distinctive, the other subspecies form a paraphyletic group within which there is no diagnosable genetic differences (K.A. Tolley, unpubl. data 2022). *Other important names*: none.

Distribution: Widespread in southern Africa, extending from Namibia through Botswana, northern South Africa and Eswatini, into southern Mozambique and southeastern Zimbabwe (Broadley 1971a; Branch 1998; Tolley et al. 2020). Given the lack of differences between subspecies, the distribution of this snake has been mapped according to likely connectivity among subpopulations rather than according to the

Elapsoidea sundevallii fitzsimonsi, near Molopo Game Reserve, North West province (© G. Alexander).

Elapsoidea sundevallii longicauda, Medupi, North West province (© G. Alexander).

Elapsoidea sundevallii media, Lydenburg, Mpumalanga province (© G.K. Nicolau).

Elapsoidea sundevallii decosteri, Kosi Bay, KwaZulu-Natal province (© D. van Eyssen).

described subspecies. *EOO*: 846 000 km^2; *Distribution*: 318 000 km^2.

Countries of occurrence: Botswana, Eswatini, Mozambique, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Occurs in a wide variety of habitats but appears to favour alluvial and aeolian sands (Broadley 1971a). Occurs from sea level to 1 800 m a.s.l. *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread species that occurs in areas that are not heavily impacted by habitat transformation.

Conservation and research recommendations: The taxonomic relationships between *E. sundevallii* subspecies should be investigated in a phylogenetic framework, as most morphological characters overlap, and they are largely defined on the basis of colour patterns and distribution.

Elapsoidea sundevallii sundevallii (© G. Alexander).

Elapsoidea sundevallii sundevallii, Midmar Dam, KwaZulu-Natal province (© T. Ping).

Family **Elapidae**

Hemachatus haemachatus (Bonnaterre, 1790)

Rinkhals

Regional near-endemic

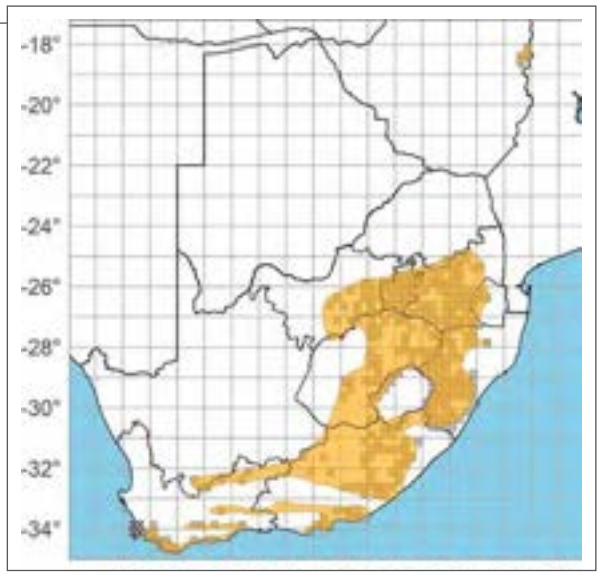
LC – Least Concern (Global)

Assessor: Alexander, G.J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: This species is widespread and is common over large parts of its geographic range. However, some subpopulations have been negatively impacted due to urbanisation (e.g., Cape Town and Johannesburg) and the presumed local extinction of the Cape Town subpopulation has led to a decline in the EOO. Furthermore, there is an isolated subpopulation in the Eastern Highlands of Zimbabwe, but there are no recent records from this area suggesting that this subpopulation has declined. Nevertheless, the large distribution and otherwise local abundance of this species mitigates against these threats.

Hemachatus haemachatus, Johannesburg, Gauteng province (© G. Alexander).



Taxonomic notes: This species displays regional variation in size and colouration, and there is an isolated subpopulation in the southern Great Escarpment and the eastern highlands of Zimbabwe (Alexander 1996). A phylogeographic analysis indicates limited genetic structuring across South Africa (Brand 2020). Although there is no phylogenetic data available for the relict subpopulation in the Nyanga District of Zimbabwe, snakes from this area appear to be morphologically different with lower ventral and subcaudal counts than those in South Africa. *Other important names*: none.

Distribution: This species has a patchy distribution occurring from the Cape Fold Mountains and Great Escarpment in the Western Cape province, into the Eastern Cape province. The distribution is more continuous northwards into western Eswatini to northern Mpumalanga and eastern North West provinces. Restricted to lower elevations in Lesotho. Historical records in the northwestern regions of the Western Cape province along the Great Escarpment (Broadley 1990a), which were previously treated as questionable were confirmed by several contemporary records (since 2016). Historical records from the Kimberley area have not been confirmed. Over the last several decades, there have been very few records from the Cape Town area, which is on the periphery of the distribution, and this subpopulation seems to have declined to the point that it is unlikely to be viable. There is an isolated subpopulation in the eastern highlands of Zimbabwe (Broadley 1974;

Hemachatus haemachatus, Makhanda, Eastern Cape province (© C. Keates).

Broadley & Blaylock 2013), but no recent records have been collected from this subpopulation. *EOO*: 969 000 km^2; *Distribution*: 381 500 km^2.

Countries of occurrence: Eswatini, Lesotho, South Africa, Zimbabwe.

Habitat and ecology: Occurs in open Grassland in the north of the range, and in Fynbos, Thicket and Karroid Vegetation in the south. It uses a wide variety of substrates, and has been recorded from rocky outcrops and the margins of wetlands (Dawson et al. 1991) from sea level into mountainous areas up to 2 500 m a.s.l. Can be locally common, even in some peri-urban areas (Alexander 1996) but does not seem to persist in heavily transformed areas. *Habitat*: Grassland, Shrubland.

Threats: Transformation of habitat due to urbanisation has resulted in subpopulation declines and apparent local extinctions. This species appears to have become locally extinct from most of the Cape Town (Western Cape province) and parts of Johannesburg (Gauteng province) metropolitan areas. Subsistence agriculture in the Eastern Highlands of Zimbabwe has led to habitat transformation, possibly contributing to the decline of this subpopulation. *Use and trade*: Although traded locally by some hobbyists, there is no known substantial local or international trade in this species.

Population trend: This snake is locally abundant in parts of its range but appears to have declined, possibly to the point of local extinction of subpopulations, in the Eastern Highlands of Zimbabwe, as well as in some urbanised areas of South Africa. However, it is widespread and relatively abundant throughout most of the range, and this should mitigate the overall extinction risk. Given there are a number of subpopulations considered to be in decline, the overall population trend points to a relatively minor decline.

Conservation and research recommendations: A systematic survey of the population in the Eastern Highlands of Zimbabwe, combined with a taxonomic study of this isolated subpopulation, would clarify the status of the subpopulations and better inform future conservation assessments.

Family **Elapidae**

Naja annulifera Peters, 1854

Snouted Cobra

LC – Least Concern (Regional)

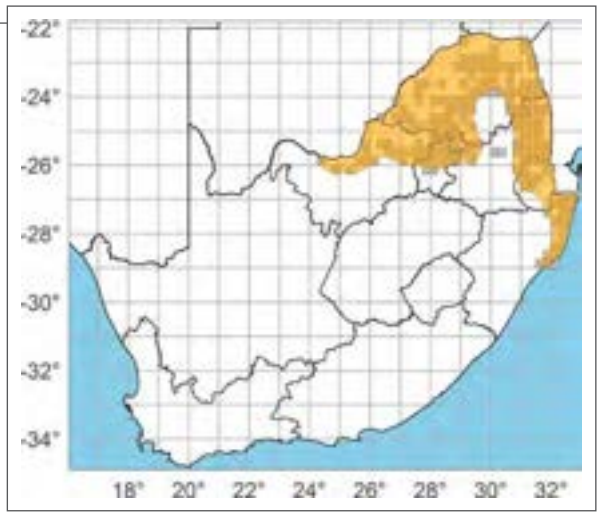
Assessors: Alexander, G.J., Maritz, B.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: From southern Zambia and southern Malawi southwards through Zimbabwe and central and southern Mozambique to South Africa and Eswatini, just entering southeastern Botswana (Broadley 1990a). In South Africa, it occurs widely in the northern regions from northern KwaZulu-Natal province to the northern half of North West province. *EOO*: 392 000 km²; *Distribution*: 210 000 km².



Naja annulifera, Mduku, KwaZulu-Natal province (© T. Ping).

Naja annulifera, Vivo, Limpopo province (© C. & S. Dorse).

Naja annulifera, Dinokeng Game Reserve, Gauteng province (© G. Alexander).

Countries of occurrence: Botswana, Eswatini, Malawi, Mozambique, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Inhabits Savanna and Grassland, entering Coastal Scrubland and Forest, from near sea level to 1 400 m a.s.l. Takes refuge in holes in the ground, old termite mounds and rocky outcrops, and basks near its retreat (Jacobsen 1989). *Habitat*: Forest, Grassland, Savanna.

Threats: There are no substantial threats to this species. *Use and trade*: There is no known utilisation.

Population trend: The population size is assumed to be stable because this is a widespread and common species, and the extent of habitat transformation is small in relation to the large range of this snake.

Conservation and research recommendations: No recommendations.

Family **Elapidae**

Naja mossambica Peters, 1854

Mozambique Spitting Cobra

LC – Least Concern (Regional)

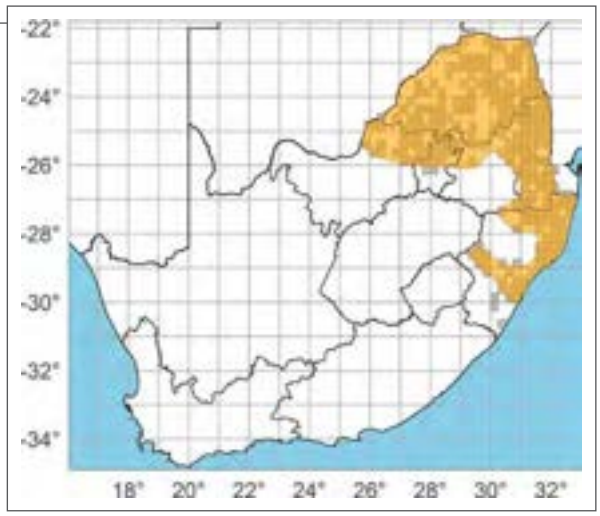
Assessors: Alexander, G.J., Maritz, B.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant, with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Widespread in eastern and southern Africa. Occurs from southern Tanzania westwards to southern Angola and northern Namibia, and southwards to South Africa and Eswatini (Broadley 1990a). In South Africa it occurs widely in the northern regions from KwaZulu-Natal province to the northeastern parts of the North West province. *EOO*: 383 000 km²; *Distribution*: 264 000 km².



Countries of occurrence: Angola, Botswana, Eswatini, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Shelters in holes in the ground, under rocks, in rock crevices and in and under logs. Occurs at elevations of 0–1 750 m a.s.l. (Jacobsen 1989; Bourquin 2004). *Habitat*: Forest, Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Naja mossambica, near Steelpoort, Mpumalanga province (© G. Alexander).

Naja mossambica, Soutpansberg, Limpopo province (© R. van Huyssteen).

Family **Elapidae**

Naja nigricincta Bogert, 1940

Western Barred Spitting Cobra

LC – Least Concern (Regional)

Assessors: Alexander, G.J., Maritz, B.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
1988: Restricted (Regional assessment).

Subspecies assessed:
2014: *Naja nigricincta woodi* – Least Concern (SARCA).

Assessment rationale: This species is widespread with only minor habitat transformation within its range. There are no known major threats.

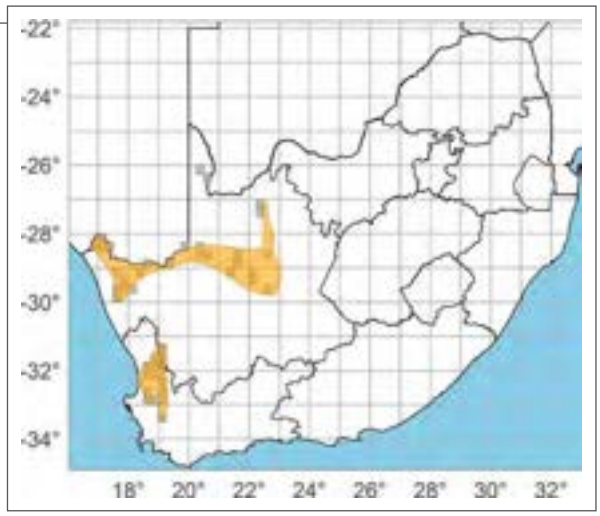
Taxonomic notes: Only the subspecies *N. nigricincta woodi* occurs in South Africa. Wüster et al. (2007) considered this taxon as a subspecies of *N. nigricincta,* although they cautioned that the taxonomy of the *N. nigricollis–N. nigricincta* complex still requires further study. *Other important names*: *Naja nigricincta woodi*.

Distribution: From southern Angola and Namibia into the arid regions of western South Africa (Branch 1998). The subspecies *N. n. woodi* occurs in southern Namibia and South Africa in the Northern Cape province as far east as Prieska, and it has been recorded as far south as the southern Cederberg in the Western Cape province. There is an apparent distribution gap along the west coast of South Africa. A single record from the west coast and a sight record from the Tankwa Karoo are both considered doubtful and are not mapped. Records from near Cape Town and Cape St Francis are considered to have been snakes brought in by people. *EOO*: 303 000 km²; *Distribution*: 63 800 km².

Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: Inhabits arid rocky regions. *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species in South Africa, as most of its range is intact, with only some areas having undergone habitat transformation.



Population trend: The widespread occurrence and abundance of this species mitigates against the negative effects of local population declines caused by habitat transformation.

Conservation and research recommendations: No conservation measures are recommended. However, the taxonomy of the *N. nigricincta–N. nigricollis* complex needs to be addressed in a phylogenetic framework.

Naja nigricincta woodi, Groblershoop, Northern Cape province (© D.W. & E.W. Pietersen).

Family **Elapidae**

Naja nivea (Linnaeus, 1758)

Cape Cobra

LC – Least Concern (Regional)

Assessors: Alexander, G.J., Maritz, B.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

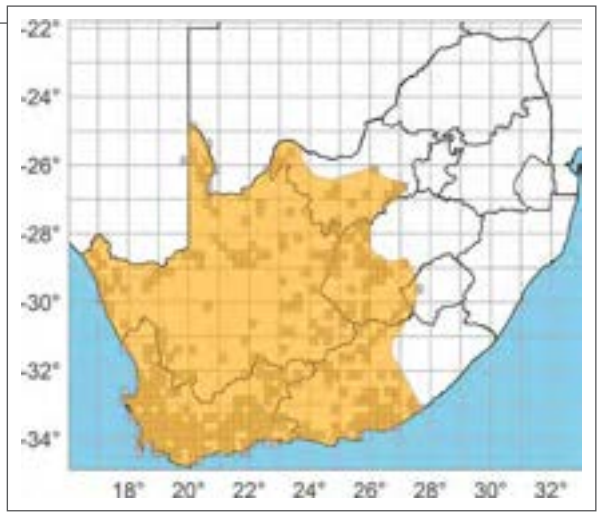
Assessment rationale: Widespread and abundant with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs from the southern half of Namibia and Botswana south to the arid western half of South Africa (Broadley & Wüster 2004). It is widespread in western and central South Africa, but historical records from Lesotho and the northern parts of the Eastern Cape province require confirmation. *EOO*: 943 000 km²; *Distribution*: 732 000 km².

Countries of occurrence: Botswana, Lesotho, Namibia, South Africa.

Habitat and ecology: Inhabits arid Karoo, open Fynbos and Grassland habitats (Branch 1998). Found in disused mammal burrows and under rocks at elevations as high as 1 600 m a.s.l. (De Waal 1978; Jacobsen 1989). Within its range, it is a habitat generalist that adapts well to urban environments if sufficient remnant natural habitat is available. It is often found within town and city limits. In the Western Cape province, adults use refugia for up to four years (Phelps 2007). *Habitat*: Grassland, Savanna, Shrubland.



Threats: There are no substantial threats to this species. *Use and trade*: There is no known utilisation.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.

Naja nivea, Makhanda, Eastern Cape province (© C. Keates).

Naja nivea, Noup, Northern Cape province (© G. Alexander).

Naja subfulva Laurent, 1955

Brown Forest Cobra

LC – Least Concern (Regional)

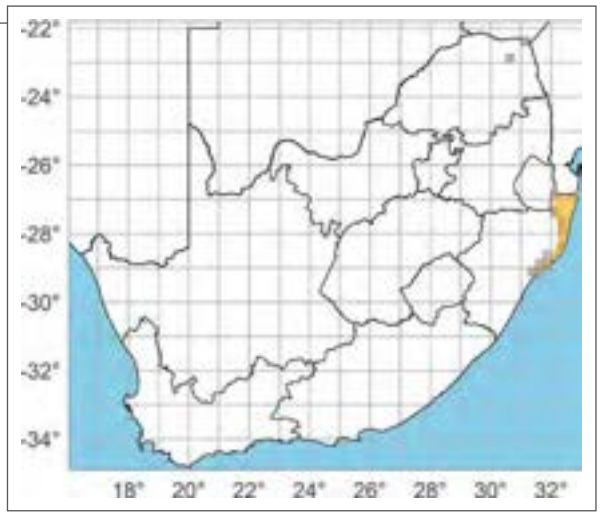
Assessor: Alexander, G.J.

Previous Red List categories:

2021: Least Concern (Global IUCN assessment).
2014: Least Concern as *Naja melanoleuca* (SARCA).

Assessment rationale: Although this snake has a moderate-sized distribution in South Africa, it is abundant within parts of its range.

Taxonomic notes: Phylogenetic analyses together with morphological data has clarified the long-standing taxonomic uncertainty surrounding the widespread *N. melanoleuca* species complex, which now contains five species (Ceríaco et al. 2017; Wüster et al. 2018). The previously widespread *N. melanoleuca* is restricted to central Africa, *N. guineensis* occurs along the southern margin of West Africa, *N. savannula* occurs in the Savanna of western and central Africa, *N. peroescobari* is endemic to the island of São Tomé and *N. subfulva* is widespread from central to northeast Africa and southwards to Angola in the west and South Africa in the east. The full range of morphological variation within *N. subfulva*, the most wide-ranging member of the complex, has not been investigated, and cryptic diversity may exist within this taxon (Wüster et al. 2018). *Other important names*: *Naja melanoleuca*.



Distribution: From coastal KwaZulu-Natal province, South Africa, northwards to Kenya and Ethiopia and

Naja subfulva, Hluhluwe, KwaZulu-Natal province (© T. Ping).

Family **Elapidae**

Naja subfulva, St Lucia, KwaZulu-Natal province (© T. Ping).

westwards to Chad, Cameroon and extreme south-eastern Nigeria in the north and Angola in the south (Wüster et al. 2018). There are also isolated records at Pafuri River Camp in the Kruger National Park (Marais & Jubber 2010) and in the southern Soutpansberg, suggesting that the species may extend inland along the Luvuvhu River. *EOO*: 99 000 km^2; *Distribution*: 9 740 km^2.

Countries of occurrence: Angola, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Ethiopia, Gabon, Kenya, Malawi, Mozambique, Republic of the Congo, Rwanda, Somalia, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a wide range of Woodland and Forest habitats, in or near water and may climb into low bushes (Branch 1998). *Habitat*: Forest, Savanna.

Threats: No significant threats, although habitat throughout its range is under threat from land transformation (e.g., coastal housing developments, small- and large-scale agriculture, commercialised afforestation of exotic species and strip mining).

Population trend: Globally, the population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species. This is also true for the South African population.

Conservation and research recommendations: No recommendations.

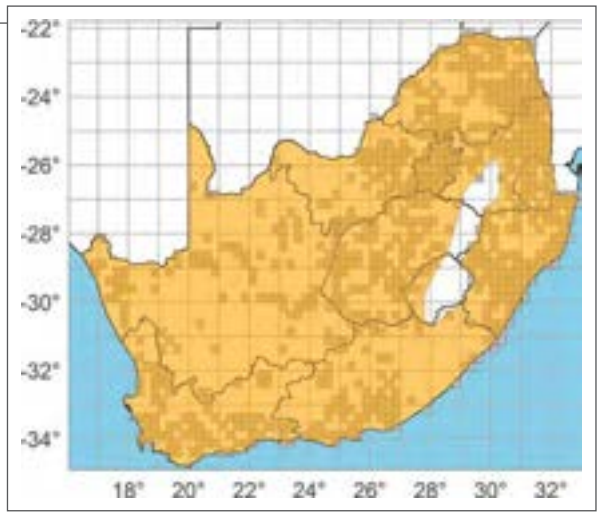
Family **Lamprophiidae**

Boaedon capensis Duméril, Bibron & Duméril, 1854

Brown House Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and abundant throughout its range with no major threats. It is commensal with humans in many areas and is also tolerant of some level of habitat modification.

Taxonomic notes: There may be cryptic taxa within *B. capensis* (Kelly et al. 2011; Hallermann et al. 2020), and the well-known '*mentalis*' morphotype of the western arid region of the subcontinent (Branch 1998) was recently recognised as a full species (Hallermann et al. 2020). There is long-standing confusion between the ranges of *B. capensis* and *B. fuliginosus*. *Boaedon fuliginosus* was considered to be restricted to West Africa by Trape and Mediannikov (2016), although Hallerman et al. (2020) assign specimens from northeastern Angola to *B. fuliginosus*, and dark-coloured individuals from northern Zambia have also been referred to *B. fuliginosus* (Broadley et al. 2003; Pietersen et al. 2021). Hughes (1997) considered *B. fuliginosus* to occur sympatrically with *B. capensis* in East Africa and the Horn of Africa, a concept that has not been followed by Spawls et al. (2018), which refer all East African material to the *B. fuliginosus* group. Until a full examination of existing material relating to the taxonomic status of this species is done, this assessment follows Hughes (1997) in the separation of *B. capensis* and *B. fuliginosus*. *Other important names*: *Lamprophis capensis*; *Lamprophis fuliginosus*.

Boaedon capensis, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Family **Lamprophiidae**

Boaedon capensis, Pontdrift, Limpopo province (© L. Verburgt).

Distribution: A very widespread species that occurs across most of southern, Central and East Africa (Hughes 1997; Branch 1998; Pietersen et al. 2021). Occurs in the eastern part of Africa from Somalia in the north to the southern parts of South Africa, reaching its western extent in central Zambia. It has not yet been recorded from Angola (Hallermann et al. 2020) but it is thought to occur across most of Namibia. Has not been recorded from the Democratic Republic of the Congo but is likely to occur in the Katanga Pedicle where it borders Zambia. In the region, it is absent from most of Lesotho, and there are few or no records from high-elevation escarpment regions, parts of the Eastern Cape province and the Great Karoo. *EOO*: 1 560 000 km^2; *Distribution*: 1 200 000 km^2.

Countries of occurrence: Botswana, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Somalia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Inhabits a wide variety of habitats and appears to be tolerant of habitat transformation, however it probably does not occur in high-elevation Grasslands. *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: There are no significant threats to this species. *Use and trade*: Individuals are collected from the wild as pets, but are largely not traded, and unlikely collected in large enough numbers to threaten the species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: An in-depth phylogenetic study with comprehensive sampling of this and allied taxa is required to assess the taxonomic status of the various clades and better define their geographic ranges.

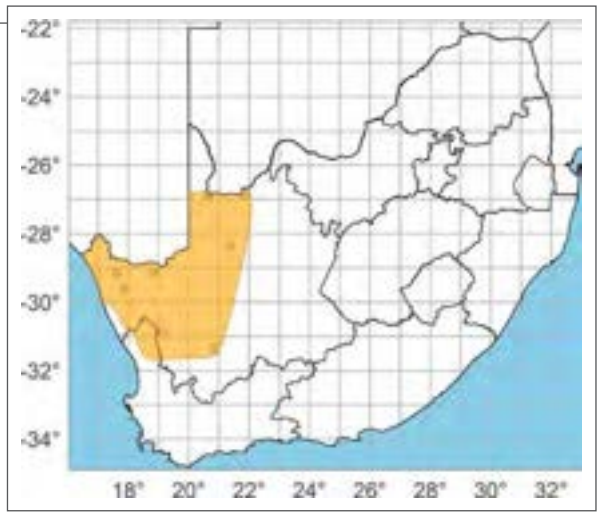
Family **Lamprophiidae**

Boaedon mentalis (Günther, 1888)

Bug-eyed House Snake

LC – Least Concern (Regional)

Assessors: Conradie, W., Weeber, J., Pietersen, D.W., Alexander, G.J., Tolley, K.A.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

Assessment rationale: This species has a large range in an area that has not undergone substantial habitat transformation.

Taxonomic notes: Günther (1888) described *B. mentalis* based on a single specimen from 'Damara Land', but the type locality appears to be in error (see Hallermann et al. 2020). Most authors regarded it as a subspecies of *B. fuliginosus* and subsequently *B. capensis* (Loveridge 1957; FitzSimons 1962; Broadley 1983). However, Vidal et al. (2008) showed that *B. mentalis* is a sister clade to a larger clade comprising *B. fuliginosus*, *B. lineatus*, *B. olivaceus* and *B. capensis*, supporting the revalidation of the taxon as a full species. Based on a molecular phylogeny, supported by morphological differences, *B. mentalis* was reinstated as a full species by Hallermann et al. (2020). *Boaedon mentalis* appears to have two different colour patterns, plain and striped, that appear to co-occur across the range. *Other important names*: *Boaedon fuliginosus mentalis*; *Lamprophis capensis*; *Lamprophis fuliginosus*.

Boaedon mentalis, Springbok, Northern Cape province (© G.K. Nicolau).

Family **Lamprophiidae**

Boaedon mentalis, Spektakel Pass, Northern Cape province (© T. Ping).

Boaedon mentalis, Steinkopf, Northern Cape province (© M. Petford).

Distribution: Occurs from southern Angola through Namibia into the Northern Cape province, South Africa. *Boaedon mentalis* occurs sympatrically with *B. capensis* (Kelly et al. 2011) and existing museum specimens need to be re-examined and possibly reassigned. Therefore, only specimens that can be confirmed to be *B. mentalis* are represented in the distribution map. *EOO*: 215 000 km^2; *Distribution*: 167 000 km^2.

Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: Recorded from Savanna in southern Angola and northern Namibia, while southern Namibia and South African populations occur in more arid Shrublands. *Habitat*: Savanna, Shrubland.

Threats: There are no significant threats to this species. *Use and trade*: Individuals are collected from the wild as pets, but these collections are unlikely to pose a significant risk to the species.

Population trend: The population size is thought to be stable as this snake occurs in areas that have not been impacted by habitat transformation.

Conservation and research recommendations: Available museum material should be examined to separate *B. mentalis* specimens from the widespread *B. capensis* specimens to allow an assessment of the distribution for *B. mentalis*. Further taxonomic work is needed to assess whether the southern population from South Africa and southern Namibia represents a separate species.

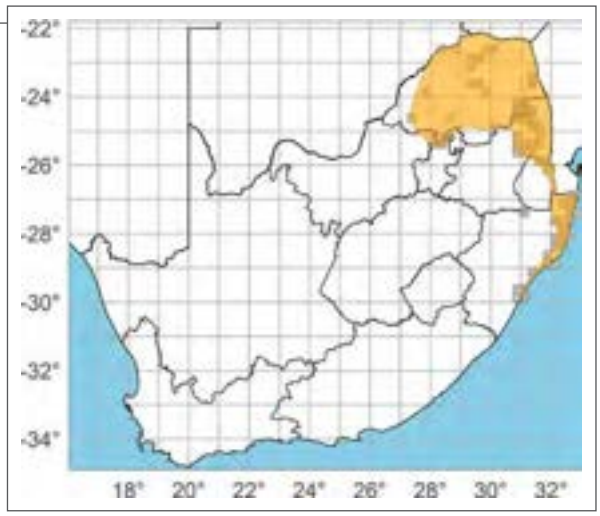
Family **Lamprophiidae**

Gracililima nyassae (Günther, 1888)

Black File Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.



Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2014: Least Concern as *Gonionotophis nyassae* (SARCA).
2010: Least Concern as *Mehelya nyassae* (Global IUCN assessment).

Assessment rationale: Widespread and common in parts of its distribution, with no known substantial threats.

Taxonomic notes: Formerly included in the genus *Gonionotophis*, this species has been transferred to the newly erected genus *Gracililima* (Broadley et al. 2018). *Other important names*: *Mehelya nyassae*; *Gonionotophis nyassae*.

Distribution: Widespread in sub-Saharan Africa, occurring from Somalia southwards to South Africa and westward to Namibia (Broadley 1990a; Broadley et al. 2018). In the region, it occurs in coastal KwaZulu-Natal province, through eastern Eswatini into northeastern South Africa. There is an isolated record in the inland region of northern KwaZulu-Natal province that requires confirmation. *EOO*: 291 000 km^2; *Distribution*: 150 000 km^2.

Countries of occurrence: Botswana, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Somalia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in Savanna and Forest habitats from near sea level in the coastal lowlands of KwaZulu-Natal province to elevations up to 1 500 m a.s.l. in Limpopo province, South Africa. May be found in holes in the ground, in moribund termitaria and under rocks on soil (Jacobsen 1989; Branch 1998). *Habitat*: Forest, Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread species, and the extent of habitat transformation is small in relation to the large range of this species.

Conservation and research recommendations: No recommendations.

Gracililima nyassae, St Lucia, KwaZulu-Natal province (© T. Ping).

Gracililima nyassae, Hoedspruit, Limpopo province (© D.W. Pietersen).

Family **Lamprophiidae**

Inyoka swazicus (Schaefer, 1970)

Swazi Rock Snake

Regional endemic

LC – Least Concern (Global)

Assessor: Maritz, B.

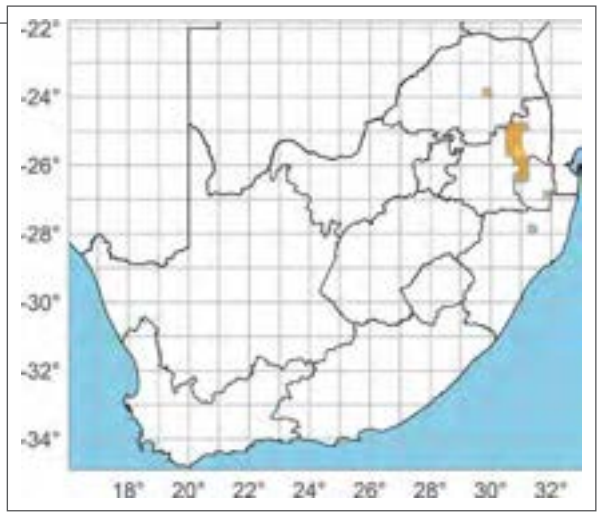
Previous Red List categories:

2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Lower Risk/Near Threatened as *Lamprophis swazicus* (Global IUCN assessment).
1994: Rare as *Lamprophis swazicus* (Global IUCN assessment).

Assessment rationale: Although the species is rarely encountered, it occurs over a fairly wide range in rocky habitats that do not appear to be significantly impacted by anthropogenic habitat transformation.

Taxonomic notes: No taxonomic issues. *Other important names*: *Lamprophis swazicus*.

Inyoka swazicus, Graskop, Mpumalanga province (© C.R. Hundermark).



Distribution: Occurs from northern Eswatini along the northeastern escarpment of Mpumalanga province, South Africa, and along the escarpment in Limpopo province. Although records are patchy in some areas, it is possible that the distribution is more continuous. There are two isolated records: Big Ben (Eswatini) 100 km to the southeast and Ngome Forest (KwaZulu-Natal province) 170 km to the south of the main distribution. *EOO*: 40 400 km^2; *Distribution*: 8 190 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Inhabits rock outcrops at elevations between 1 400 and 1 900 m a.s.l. (Jacobsen 1989; Branch 1998). *Habitat*: Grassland, Savanna.

Threats: Although mining and silviculture have transformed the area in general, this probably has little impact on *I. swazicus* given that it occurs on rocky outcrops that are not typically impacted.

Population trend: The population size is thought to be stable as the rupicolous habitat of this snake has not been significantly impacted by habitat transformation.

Conservation and research recommendations: This species is rarely encountered, so additional information on its distribution and habits would allow for a more informed assessment.

Family **Lamprophiidae**

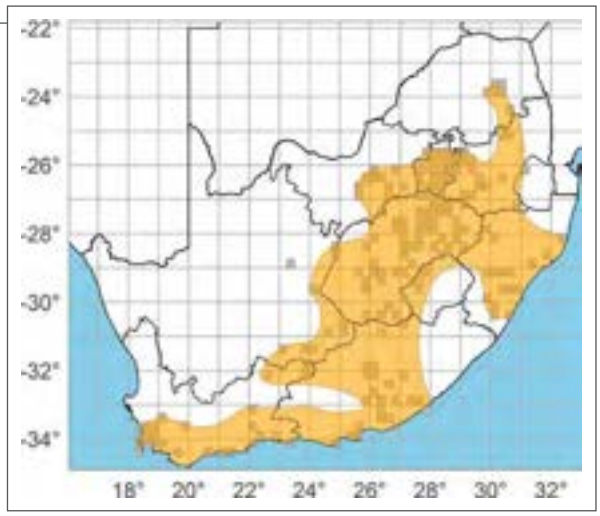
Lamprophis aurora (Linnaeus, 1758)

Aurora House Snake

Regional endemic

LC – Least Concern (Global)

Assessor: Maritz, B.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common in suitable habitat, although much of the habitat within the distribution has been transformed and this could cause local population declines.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Has a wide distribution across north-eastern, central and southern South Africa extending into western Lesotho (Sehlabathebe; Ambrose 2006) and has been recently recorded from Eswatini. There is an isolated historical record from the Northern Cape province about 160 km west of Kimberley (FitzSimons 1962). The isolated, historical records from Nieuwoudtville (Northern Cape province, South Africa) and Serowe (Botswana; Broadley & Blaylock 2013) are of unknown provenance and are not included in the current distribution map. *EOO*: 827 000 km²; *Distribution*: 497 000 km².

Countries of occurrence: Eswatini, Lesotho, South Africa.

Habitat and ecology: Occurs in Grassland, Fynbos and Mesic Savanna habitats from sea level to high-elevation plateau (1 700 m a.s.l.). It has been recorded from under rocks and in old termitaria (De Waal 1978; Jacobsen 1989). *Habitat*: Grassland, Savanna, Shrubland.

Threats: Approximately half of the range has been transformed for commercial and subsistence agriculture, especially in the Highveld Grasslands of South Africa. This could cause local population declines.

Use and trade: Appears to be in the pet trade but the extent of the use is not known.

Population trend: Due to habitat loss across large parts of the range, the population is likely to be in decline.

Conservation and research recommendations: Quantification of the extent of pet trade and whether this poses a threat to this species is needed.

Lamprophis aurora, Johannesburg, Gauteng province (© C.R. Hundermark).

Family **Lamprophiidae**

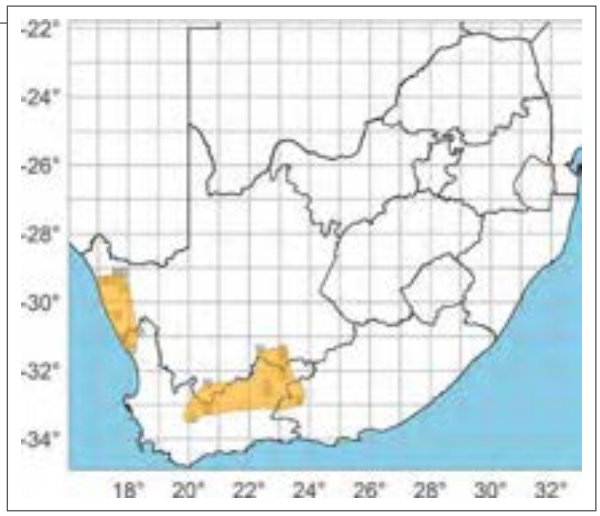
Lamprophis fiskii Boulenger, 1887

Fisk's Snake

South African endemic

LC – Least Concern (Global)

Assessor: Maritz, B.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Data Deficient (Global IUCN assessment).
1996: Vulnerable (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Assessment rationale: Fairly widespread and distributed throughout areas where there is relatively little habitat loss.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Distributed in the southwestern and western arid regions of South Africa (Barts et al. 2012). The range is possibly fragmented into western and southern subpopulations, as there is a lack of records from intervening mountainous areas. A record to the extreme southwest (see Maritz 2014a) was incorrectly georeferenced and has been excluded. *EOO*: 171 000 km^2; *Distribution*: 62 000 km^2.

Lamprophis fiskii, Matjiesfontein, Western Cape (© C. & S. Dorse).

Country of occurrence: South Africa.

Habitat and ecology: Occurs in a wide variety of habitats, especially rocky and sandy areas in arid regions (Branch 1998; Barts et al. 2012) and may be associated with temporary waterbodies in some places. *Habitat*: Shrubland.

Threats: There are no significant threats to this species. *Use and trade*: This species is not extensively utilised; however, individuals are occasionally found in the pet trade.

Population trend: The population size is assumed to be stable because it is fairly widespread with most of the distribution in areas that are not significantly impacted by habitat transformation.

Conservation and research recommendations: Improved knowledge of range and habitat associations would improve the interpretation of the distribution. Quantification of the extent of pet trade and whether this poses a threat to this species is needed.

Family **Lamprophiidae**

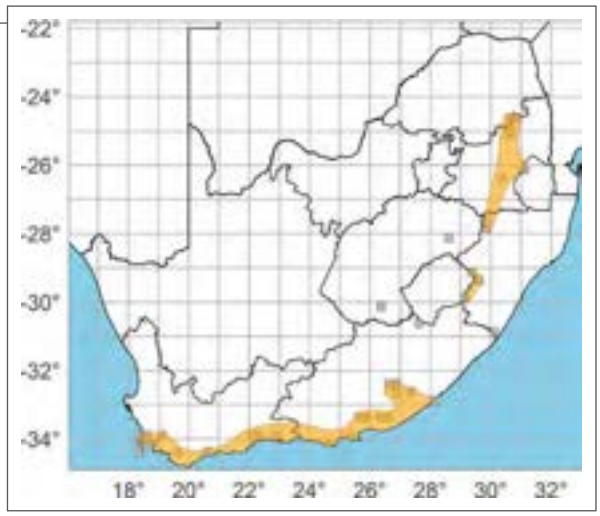
Lamprophis fuscus Boulenger, 1893

Yellow-bellied House Snake

Regional endemic

LC – Least Concern (Global)

Assessors: Maritz, B., Alexander, G.J., Tolley, K.A., Conradie, W., Pietersen, D.W.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
1996: Lower Risk/Near Threatened (Global IUCN assessment).
1994: Rare (Global IUCN assessment).

Assessment rationale: Widespread but patchy in occurrence. There has been some habitat transformation, especially in the northern parts of the range, which might have caused local declines. However, the extent of any declines is not significant enough to consider this species at risk of extinction.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: This species has a widespread but patchy distribution, occurring in western Eswatini and along the eastern margin of South Africa from northern Mpumalanga province into the southwestern Cape region. Records are widely scattered, which might suggest a naturally patchy distribution, or that there are several subpopulations. Some records fall outside the interpreted distribution and the extent of connectivity across these areas is not known. It may also occur in Limpopo province and western Lesotho, although this requires confirmation. *EOO*: 613 000 km^2; *Distribution*: 71 700 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: A rarely encountered snake and as such its biology is poorly known. It has been recorded from Fynbos and Grassland and utilises moribund termitaria (De Waal 1978; Jacobsen 1989; Branch 1998). *Habitat*: Grassland, Shrubland.

Threats: Parts of the range, especially in the north, have been transformed by agriculture, afforestation and changes in fire regimes. The Grassland and Fynbos habitats where it occurs have declined in extent (Skowno et al. 2019) and this could be linked to apparent local declines.

Population trend: Although this species is not considered to be in decline overall, virtually all recent records have been from the southern subpopulation. The northern subpopulations are probably more heavily impacted by habitat loss, and these subpopulations might be in decline.

Conservation and research recommendations: Because this species is rarely recorded and its biology is poorly known, better information regarding its distribution, habitat preferences and whether the threats in its range are having an impact would be useful.

Lamprophis fuscus, Long Tom Pass, Mpumalanga province (© G.K. Nicolau).

Family **Lamprophiidae**

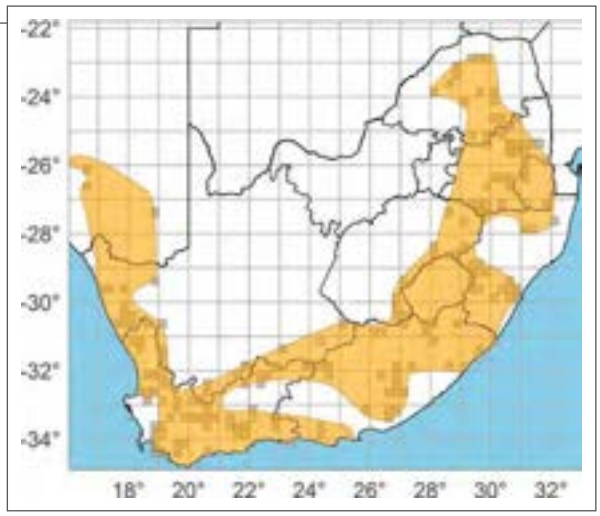
Lamprophis guttatus (Smith, 1843)

Spotted Rock Snake

Regional near-endemic

LC – Least Concern (Global)

Assessor: Maritz, B.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species that occurs in rocky habitats that are not greatly susceptible to habitat transformation.

Taxonomic notes: There is considerable variation in colour pattern (Branch 1998), habits and behaviour across the range of this species. This is accompanied by genetic divergence (Kelly et al. 2011), which suggests that there may be more than one taxon within this species. Tiutenko et al. (2022) reinstated a monotypic genus (*Alopecion*) to include this species, basing this taxonomic change on minor differences in skull shape of *L. guttatus* compared to other members of *Lamprophis*. Given that morphological change can be labile and driven by ecological or environment niche, and that the taxonomic history of this species has been complex, additional work to support the wide application of this taxonomic change is essential. *Other important names*: *Alopecion guttatum*.

Distribution: Has a wide distribution in the region, essentially along the margin of the continent from southern Namibia into western, southern and eastern South Africa, extending into Lesotho and Eswatini.

Lamprophis guttatus, Prince Albert, Western Cape province (© C.R. Hundermark).

Family **Lamprophiidae**

Lamprophis guttatus, Soutpansberg, Limpopo province (© R. van Huyssteen).

Lamprophis guttatus, Kloof region, KwaZulu-Natal province (© G. Alexander).

The type locality was originally given vaguely as 'beyond Kurrichane' (Smith 1843), a place name that refers to an iron age settlement (also known as Kaditshwene) in the Enselberg, North West province, South Africa. However, this locality is about 250 km to the west of the interpreted distribution and the nearest other record of this snake, and the species has not been recorded from anywhere in the vicinity of Kurrichane. It may occur marginally in southern Mozambique, but it has not been recorded from there. *EOO*: 1 460 000 km^2; *Distribution*: 565 000 km^2.

Countries of occurrence: Eswatini, Lesotho, Namibia, South Africa.

Habitat and ecology: Shelters in narrow crevices in rocky habitats at elevations up to 2 300 m a.s.l. (Jacobsen 1989). *Habitat*: Grassland, Savanna, Shrubland.

Threats: This species is not considered to be threatened by habitat loss. *Use and trade*: There is a low-level presence of this species in the online/internet pet trade.

Population trend: The population size is assumed to be stable because this is a widespread and relatively common species and parts of its range are not impacted by habitat transformation.

Conservation and research recommendations: Presence in the pet trade should be quantified to assess if the levels of trade could be detrimental. Given that there are potentially cryptic species within this taxon, a thorough taxonomic study incorporating phylogenetic analyses should be undertaken. In addition, the resurrection of the genus *Alopecion* should be further assessed.

Family **Lamprophiidae**

Limaformosa capensis (Smith, 1847)

Common File Snake

LC – Least Concern (Regional)

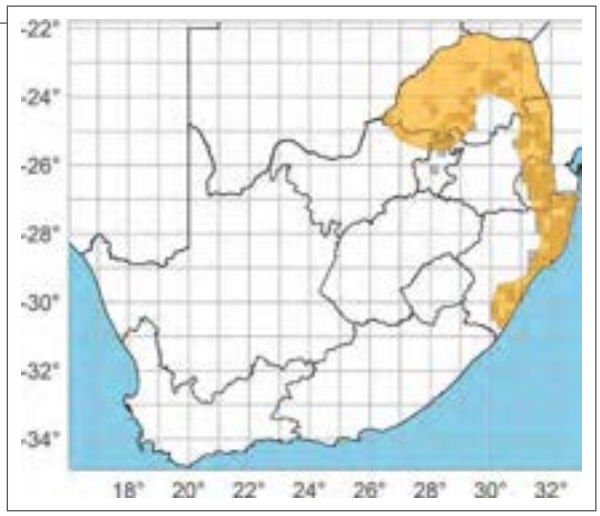
Assessor: Maritz, B.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern as *Gonionotophis capensis capensis* (SARCA).

Assessment rationale: Widespread and common in some areas with no known substantial threats, although could be in decline in the southern part of the range due to habitat transformation.

Taxonomic notes: Formerly included in the genus *Gonionotophis*, this species has been transferred to the newly erected genus *Limaformosa* (Broadley et al. 2018). A recent phylogenetic analysis showed strong divergence between individuals sampled from southern African and central Africa (Broadley et al. 2018), suggesting that cryptic species could be present within this taxon. *Other important names*: *Mehelya capensis capensis*; *Gonionotophis capensis*.

Distribution: Widespread across sub-Saharan Africa, extending into northeastern South Africa, southwards into Eswatini and along the eastern margin of KwaZulu-Natal province and westwards to North West province. There is an outlying historical record from near Johannesburg, Gauteng province. *EOO*: 373 000 km^2; *Distribution*: 186 000 km^2.



Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Eswatini, Malawi, Mozambique, Namibia, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Occurs in a variety of different habitats under rocks or logs (Jacobsen 1989) and is known to spend time underground (Alexander & Maritz 2015). *Habitat*: Forest, Grassland, Savanna.

Threats: There are no substantial threats to this species overall, but habitat transformation in parts of the range could be a threat locally.

Population trend: The population is considered stable due to the widespread range and abundance of this species that mitigates against the negative effects of local declines. However, there have been no recent records from the Johannesburg area, nor south of Durban (see Alexander 1990) although these areas were probably part of this species' historical range. This could suggest that the species is in decline in the transformed parts of its range.

Conservation and research recommendations: Genetic divergence between individuals from Central and southern Africa has been noted, but this was based on few specimens from central Africa. Given this is a widespread taxon that could contain cryptic diversity, better geographic coverage is needed to assess the existence of cryptic species.

Limaformosa capensis, Modimolle, Limpopo province (© R.I. Stander).

Family **Lamprophiidae**

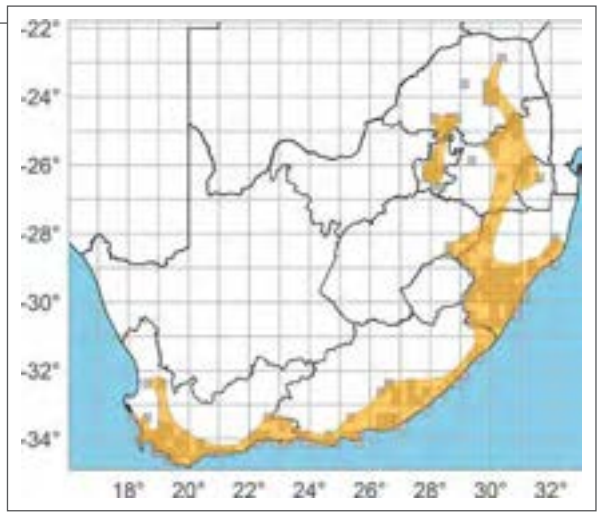
Lycodonomorphus inornatus (Duméril, Bibron & Duméril, 1854)

Olive Ground Snake

Regional endemic

LC – Least Concern (Global)

Assessor: Maritz, B.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern as *Lamprophis inornatus* (Global IUCN assessment).

Assessment rationale: Widespread and common across most of the distribution with no substantial threats.

Taxonomic notes: Northern and southern populations differ with regard to body proportions and scalation and are genetically divergent, indicating that two taxa may be present (Kelly et al. 2011). *Other important names*: *Lamprophis inornatus*.

Distribution: This species has a widespread distribution along the margin of South Africa from Limpopo province in the north to the southwestern Cape region. There is a large gap between records from Gauteng province and those from the main part of the distribution to the east, but this could be the result of poor sampling in the intervening area. A few outlying records in the north suggest the distribution could be wider, but this is difficult to confirm given the paucity of records. It has also been recorded from Eswatini and possibly occurs in Lesotho. *EOO*: 909 000 km^2; *Distribution*: 186 000 km^2.

Lycodonomorphus inornatus, Cape St Francis, Eastern Cape province (© D.W. Pietersen).

Family **Lamprophiidae**

Lycodonomorphus inornatus, Louis Trichardt, Limpopo province (© R.I. Stander).

Lycodonomorphus inornatus, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Occurs in a wide range of habitats, and shelters under rocks on soil and in or under rotting logs (Jacobsen 1989). *Habitat*: Forest, Grassland, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species with much of the distribution in areas that are not impacted by habitat transformation.

Conservation and research recommendations: A comprehensive phylogenetic analysis could assist to assess if there are cryptic species within this taxon.

Family **Lamprophiidae**

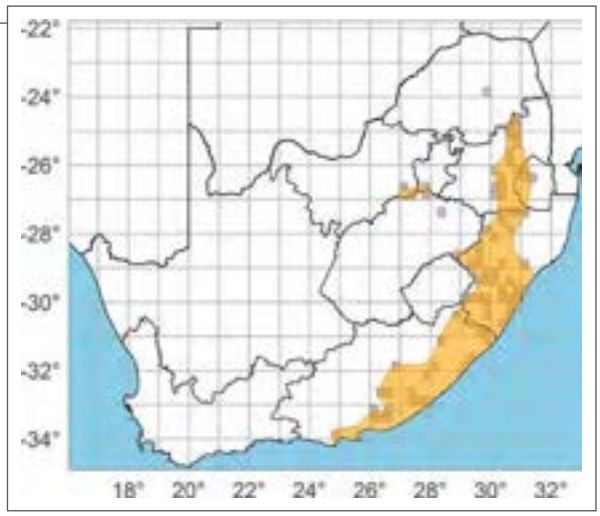
Lycodonomorphus laevissimus (Günther, 1862)

Dusky-bellied Water Snake

Regional endemic

LC – Least Concern (Global)

Assessor: Maritz, B.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is widespread and abundant, with no major threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Widespread along the eastern margin of South Africa, ranging into western Eswatini (Jacobsen 1989; Bates 1996b). There is an apparently disjunct subpopulation in extreme eastern North West, southern Gauteng and northern Free State provinces along the Vaal River (Jacobsen 1989; Bates 1996b), and this subpopulation might extend further along the river and tributaries. A previous record from northern KwaZulu-Natal province, which was previously included in the distribution (Maritz 2018) was a transcription error from the original source (Bourquin 2004). There is a single outlying specimen from Haenertsburg (Limpopo province) that was recorded in 1990, but this species has not been subsequently recorded in the area. *EOO*: 416 000 km^2; *Distribution*: 147 000 km^2.

Countries of occurrence: Eswatini, South Africa.

Habitat and ecology: Inhabits riverine and other aquatic habitats, favouring well-wooded streams (Branch 1998). It occurs from near sea level to at least 1 700 m a.s.l. (Jacobsen 1989). *Habitat*: Forest, Grassland, Shrubland, Wetlands.

Threats: There are no significant threats at present, however the species could be locally impacted by polluted waterways and abstraction from rivers and streams.

Population trend: The species is not considered to be in decline given that it is widespread and abundant.

Conservation and research recommendations: No recommendations.

Lycodonomorphus laevissimus, Port Shepstone, KwaZulu-Natal province (© K. Kyle).

Family **Lamprophiidae**

Lycodonomorphus obscuriventris FitzSimons, 1964

Floodplain Water Snake

LC – Least Concern (Regional)

Assessors: Alexander, G.J., Tolley, K.A., Pietersen, D.W., Conradie, W., Weeber, J., Maritz, B.

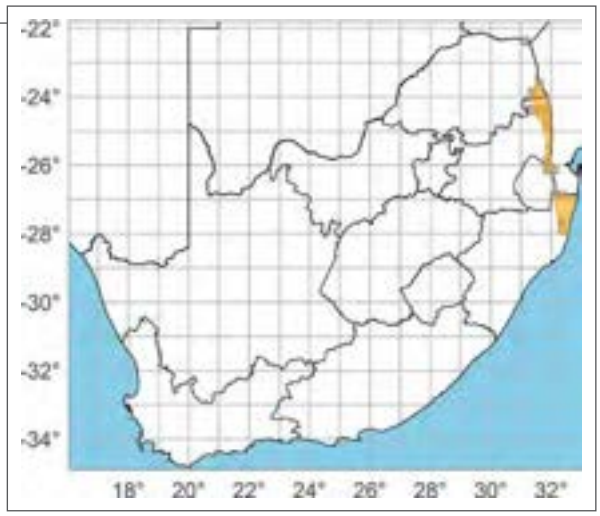
Previous Red List categories:
2021: Data Deficient (Global IUCN assessment).
2014: Least Concern (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: Although presumed to have a large distribution mainly in protected areas, this was based on fewer than 20 historical records collected prior to 2000. This snake was therefore assessed as Data Deficient globally. However, several recent records from South Africa have provided new information allowing the regional assessment to be refined. Given the new records and because range falls mainly within protected areas, the regional status is considered as Least Concern.

Taxonomic notes: This species was previously considered a subspecies of *L. whytii* but was raised to species status (Broadley 1995) based on minor scale and ecological differences from very few specimens. *Other important names*: none.

Distribution: From southern Malawi through Mozambique and southeastern Zimbabwe to the South African Lowveld, northern KwaZulu-Natal province and eastern Eswatini (Broadley 1990a; Bourquin 2004; Kyle et al. 2021). Regionally, new records show that it occurs as far south as Hluhluwe Game Reserve in KwaZulu-Natal province (Kyle et al. 2021). *EOO*: 39 400 km^2; *Distribution*: 16 000 km^2.



Countries of occurrence: Eswatini, Malawi, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Has been recorded from lowland swamps and floodplains and at the edges of temporary pans in Savanna (Broadley 1990a; Kyle et al. 2021). *Habitat*: Savanna, Wetlands.

Threats: There are no significant threats to this species given there is little habitat transformation in the areas where it has been recorded.

Population trend: Although most records of this species are from historical observations, there are several new records (Kyle et al. 2021), and many of these observations are from protected areas. The population size is therefore assumed to be stable given that this species is considered widespread and probably common, with large portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: Surveys should be conducted to better assess the status of the species and its distribution outside the region. Inclusion in a comprehensive phylogenetic analysis would be useful to define the relationship between this taxon and *L. whytii*.

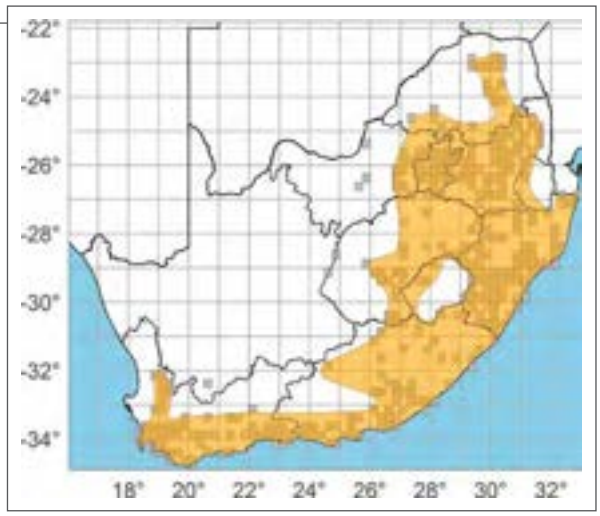
Lycodonomorphus obscuriventris, Kruger National Park, Limpopo province (© C. Keates).

Lycodonomorphus rufulus (Lichtenstein, 1823)

Brown Water Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common throughout its range, with no known substantial threats.

Taxonomic notes: The taxonomic status of the isolated subpopulation in Zimbabwe is unknown, but it is considered to be *L. rufulus*. *Other important names*: none.

Distribution: This species has a mainly temperate distribution across southern Africa and is widespread in the eastern and southern parts of South Africa. There is a disjunct subpopulation in central and eastern Zimbabwe and adjacent Mozambique (Broadley 1990a; Branch 1998). A few scattered records outside the main distribution possibly represent vagrants having dispersed along watercourses or are the result of inaccurate records. *EOO*: 1 009 000 km^2; *Distribution*: 510 000 km^2.

Countries of occurrence: Eswatini, Lesotho, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Associated with aquatic habitats including dams, streams and rivers (Branch 1998) across a range of biomes. *Habitat*: Forest, Shrubland, Wetlands.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in areas that are not impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the isolated subpopulation in Zimbabwe and adjoining regions of Mozambique should be assessed in a phylogenetic framework, as should the interspecific relationships within the genus as a whole.

Lycodonomorphus rufulus, Carolina, Mpumalanga province (© D.W. Pietersen).

Lycodonomorphus rufulus, Hazyview, Mpumalanga province (© G. Alexander).

Family **Lamprophiidae**

Lycophidion capense (Smith, 1831)

Cape Wolf Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).

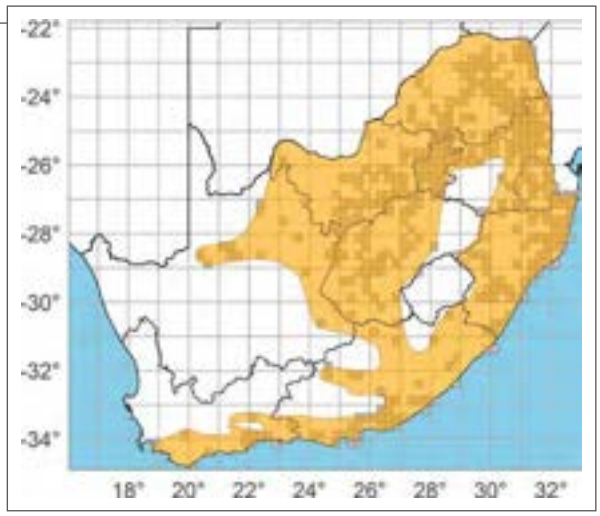
Subspecies assessed:
2014: *Lycophidion capense capense* – Least Concern (SARCA).

Assessment rationale: Widespread and common throughout its range with no known substantial threats.

Taxonomic notes: Trape (2021) elevated the former subspecies *L. capense jacksoni* to specific status. The subspecies *L. c. loveridgei* from Kenya and Tanzania might also represent a separate species. *Other important names*: none.

Distribution: Widespread through southeastern Africa from Zambia southwards to South Africa and Eswatini. Regionally, it occurs from the extreme southwest, extending eastwards along the margin of South Africa, and then northwards where it becomes widespread (see Branch 1998). In the arid areas, it extends along the Orange River watershed. *EOO*: 1 218 000 km^2; *Distribution*: 754 000 km^2.

Countries of occurrence: Botswana, Eswatini, Kenya, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia, Zimbabwe.



Habitat and ecology: Occurs from coastal regions through to higher elevations in the central portions of South Africa. Shelters under rocks or logs and in moribund termitaria (Jacobsen 1989). *Habitat*: Forest, Grassland, Savanna, Shrubland.

Threats: Although there is some habitat loss throughout the range, this is minor given the wide distribution of this snake.

Population trend: The population is considered stable due to the widespread range and abundance of this species that mitigates against the negative effects of local population declines.

Conservation and research recommendations: The validity of the subspecies *L. c. loveridgei* from East Africa needs investigation.

Lycophidion capense capense, Modimolle, Limpopo province (© R.I. Stander).

Lycophidion capense capense, Buffelskloof Private Nature Reserve, Mpumalanga province (© A. Jordaan).

Family **Lamprophiidae**

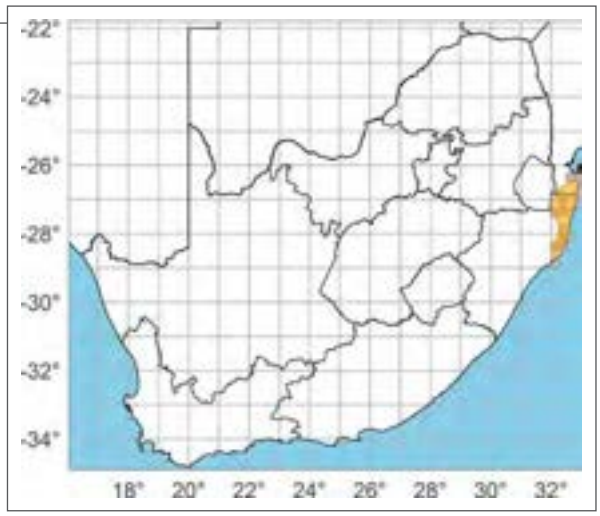
Lycophidion pygmaeum Broadley, 1996

Pygmy Wolf Snake

Regional near-endemic

NT – Near Threatened B1b(iii) (Global)

Assessors: Alexander, G.J., Maritz, B., Pietersen, D.W., Weeber, J., Conradie, W., Tolley, K.A.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Near Threatened (Global IUCN assessment).
2014: Near Threatened (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species has a moderate-sized distribution, some of which falls in an area that is heavily affected by anthropogenic impacts. Examination of the recent national land cover data shows that total habitat loss is significant (i.e., 39%) and is ongoing, with 5% of the distribution having been affected since 1990. Despite this habitat loss, about 27% of the range is in protected areas, and this likely buffers the extinction risk to some degree. Although this species was considered Least Concern in 2018, this was based on an erroneously large EOO. While the population is not considered severely fragmented, the species is now considered Near Threatened due to the significant and ongoing habitat loss within the range that is likely causing population declines.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs in northeastern KwaZulu-Natal province (Broadley 1996), South Africa, and recently recorded from adjacent southern Mozambique (Jordaan et al. 2020), extending the known range northwards. *EOO*: 14 250 km^2; *Distribution*: 12 520 km^2.

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Inhabits a variety of different mesic habitats and has been recorded from pine plantations (Branch 1998). *Habitat*: Forest, Grassland, Savanna.

Threats: In large parts of its range, this species is threatened by habitat transformation caused by afforestation, agriculture and expanding human settlement. About 39% of the habitat has been lost in total. National land cover data shows that habitat loss is ongoing, with about 5% being lost since 1990. Although this threat is significant, the species occurs in several large, protected areas covering about 27% of the range.

Population trend: The population is suspected to be in decline given that the habitat loss is ongoing.

Conservation and research recommendations: The species is considered well protected (Tolley et al. 2019a), however its biology is poorly known. Information on habitat utilisation, particularly in areas that are heavily transformed, would assist in assessing whether land transformation might be a significant threat.

Lycophidion pygmaeum, St Lucia, KwaZulu-Natal province (C & S Dorse).

Family **Lamprophiidae**

Lycophidion variegatum Broadley, 1969

Variegated Wolf Snake

LC – Least Concern (Regional)

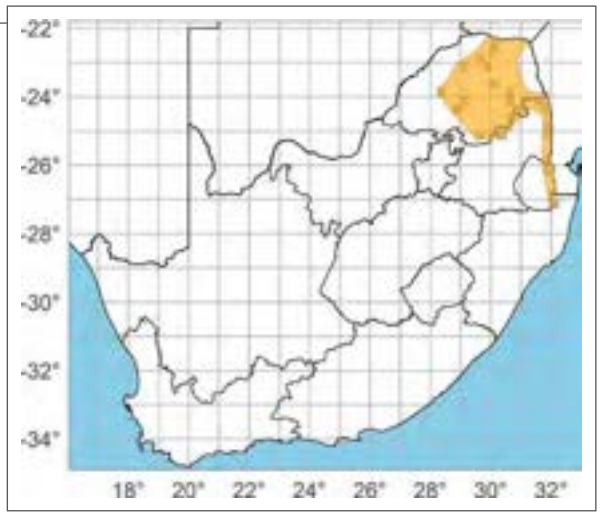
Assessor: Maritz, B.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although rarely recorded, this species is widespread regionally, with no known substantial threats.

Taxonomic notes: No outstanding taxonomic issues. *Other important names*: none.

Distribution: This species occurs throughout Zimbabwe, southwards into South Africa and eastern Eswatini, with a single record from southern Zambia. In South Africa, it occurs in Limpopo province, northern and eastern Mpumalanga province and extreme northern KwaZulu-Natal province, as far south as Ngwavuma (Broadley 1990a; Broadley 1996; Bourquin 2004). It may also occur in southern Mozambique given that there are records from the Lebombo Mountains (South Africa) and the Chimanimani Mountains (Zimbabwe), both on the border with Mozambique. Previous records of *L. semiannule* from northern KwaZulu-Natal province (Broadley 1990a), which were subsequently referred to *L. variegatum* (Maritz 2014b), are in fact referable to *L. pygmaeum* (Broadley 1996). *EOO*: 125 000 km^2; *Distribution*: 80 800 km^2.



Lycophidion variegatum, Blyde River Canyon, Limpopo province (© C.R. Hundermark).

Countries of occurrence: Eswatini, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Occurs in rocky habitats including rock outcrops, often sheltering under rocks, dead vegetation or logs. Ranges in elevation from 300 to 1 200 m a.s.l. (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with portions of the range that are not significantly impacted by habitat transformation.

Threats: There are no known substantial threats at present.

Conservation and research recommendations: None.

Family **Lamprophiidae**

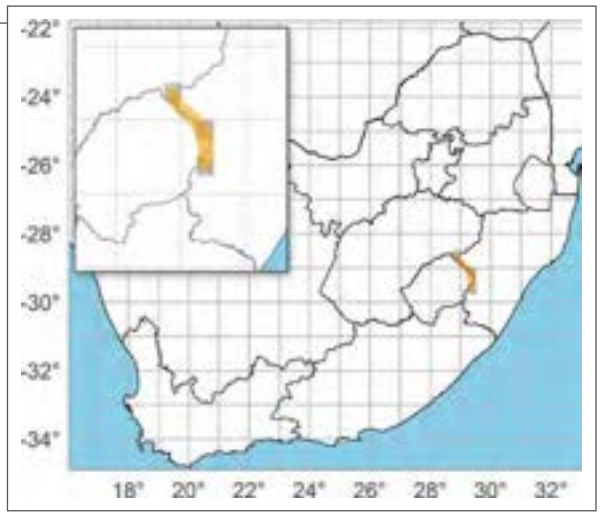
Montaspis gilvomaculata Bourquin, 1991

Cream-spotted Mountain Snake

South African endemic

DD – Data Deficient (Global)

Assessors: Maritz, B., Marais, J., Conradie, W.



Previous Red List categories:
2018: Data Deficient (Global IUCN assessment).
2017: Data Deficient (Global IUCN assessment).
2014: Data Deficient (SARCA).

Assessment rationale: A poorly known snake. There is no information regarding microhabitat preferences or natural history of this rare species, and its distribution is not well defined because there are very few records.

Taxonomic notes: The relationship of this species to other species remains uncertain. Its external morphology suggests a close relationship with *Amplorhinus*, and it was provisionally included in the Pseudoxyrhophiinae (Vidal et al. 2008; Kelly et al. 2009). However, hemipenis morphology indicates close affinities to the lamprophiids (Zaher et al. 2019), and it is thus included in the Lamprophiidae in this treatment. *Other important names*: none.

Distribution: Occurs in the Drakensberg of KwaZulu-Natal province, South Africa (Bourquin 1991, 2004; Branch et al. 1993; Branch 1998; Marais 2004) and possibly adjacent regions of Lesotho, although it has not been recorded in Lesotho. It has been recorded only at high elevations and is known from only five records (Branch et al. 1993, www.inaturalist.org/observations/109467555). Its overall distribution and EOO cannot be estimated with any confidence and therefore have not been included.

Country of occurrence: South Africa.

Habitat: Thought to inhabit areas near mountain streams and wetlands at high elevations (1 800–3 000 m a.s.l.; Bourquin 1991; Marais 2004). *Habitat*: Grassland.

Threats: It is not known if there are any threats to this species. However, given the high elevation of all records, climatic warming could represent a threat in the future.

Population trend: Unknown.

Conservation and research recommendations: At present, no specific conservation measures are suggested since there is little information on the species. Research to resolve the taxonomic uncertainty is needed, as is information on its distribution and habitat preferences.

Montaspis gilvomaculata, Drakensberg, KwaZulu-Natal province (© J. Marais).

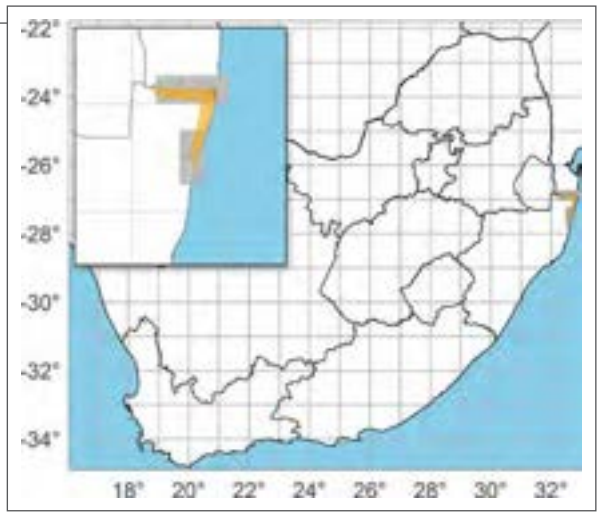
Family **Natricidae**

Natriciteres sylvatica Broadley, 1966

Forest Marsh Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Marais, J.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although this species has a small distribution in the region, most of it is within a protected area that is not impacted by habitat transformation.

Taxonomic notes: No taxonomic issues. *Other important names*: *Natriciteres variegata sylvatica*.

Distribution: Has a large range across mesic southern Africa, extending from northern South Africa to Tanzania (Broadley 1990a; Spawls et al. 2018). In South Africa, it occurs only in the extreme northern parts of KwaZulu-Natal province. *EOO*: 3 020 km²; *Distribution*: 1 420 km².

Countries of cccurrence: Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and Ecology: Associated with Lowland and Montane Evergreen Forest, recorded from forest fringes or in forest clearings (Branch 1998; Spawls et al. 2018). *Habitat*: Forest.

Threats: No significant threats.

Population trend: Because much of the regional geographic range of this species is in a protected area, the population size is assumed to be stable.

Conservation and research recommendations: No recommendations.

Natriciteres sylvatica, Kosi Bay, KwaZulu-Natal province (© K. Kyle).

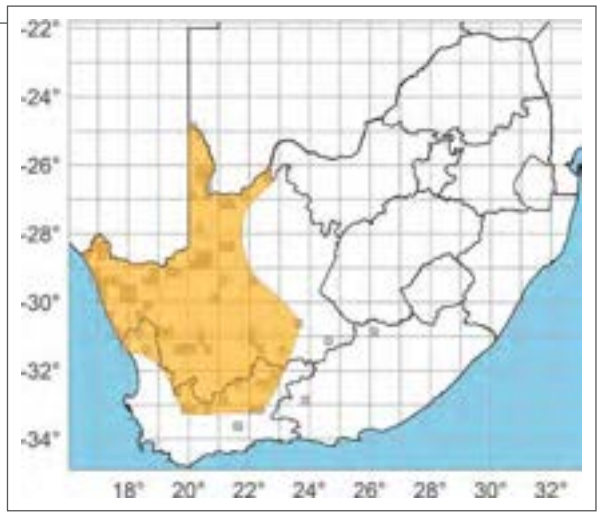
Family **Psammophiidae**

Dipsina multimaculata (Smith, 1847)

Dwarf Beaked Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Masterson, G.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread with no known significant threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: From northern Namibia through southwestern Botswana to western South Africa (Broadley 1990a; Branch 1998). Within South Africa, it occurs in the arid western and west-central areas, primarily in the Great Karoo with one historical record in the Little Karoo. Records from the northeast that were outside the main range were noted as questionable (Masterson 2014c) and are now considered to be locality conversion errors. There are also a few additional historical records from the eastern parts of the range that are not within the main distribution, but these cannot be ruled out as locality errors. *EOO*: 574 000 km²; *Distribution*: 295 000 km².

Countries of occurrence: Botswana, Namibia, South Africa.

Habitat and ecology: Occurs in arid sandy areas and has been recorded from dry watercourses. Terrestrial, using burrows for refuge and bushes for cover (Branch 1998). *Habitat*: Desert, Savanna, Shrubland.

Threats: There are no known substantial threats to this species.

Population trend: The population size is thought to be stable as the arid habitat of this snake has not been significantly impacted by habitat transformation.

Conservation and research recommendations: The recorded localities outside the main distribution require confirmation.

Dipsina multimaculata, Port Nolloth, Northern Cape province (© G. Alexander).

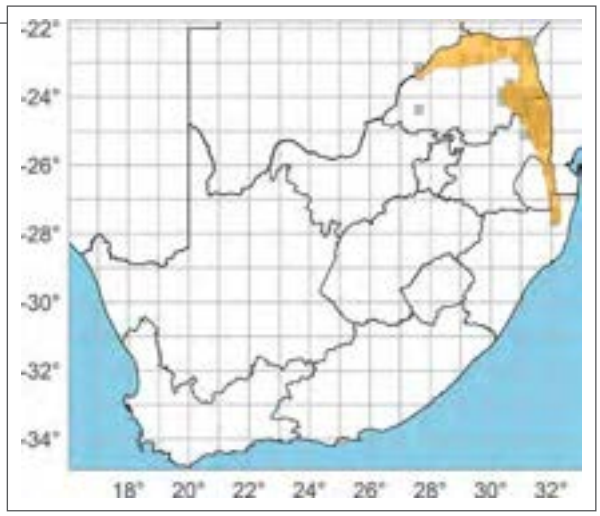
Family **Psammophiidae**

Hemirhagerrhis nototaenia (Günther, 1864)

Eastern Bark Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Masterson, G.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread with no significant threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Occurs across most of sub-Saharan Africa. Scattered records extend the range to South Sudan in the north and Burkina Faso in the west (Broadley & Hughes 2000). Regionally, it extends into South Africa from Botswana, Zimbabwe and Mozambique (Broadley 1990a; Branch 1998; Broadley & Hughes 2000), and there is a single record from eastern Eswatini. *EOO*: 185 000 km²; *Distribution*: 62 000 km².

Countries of occurrence: Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Eswatini, Kenya, Malawi, Mozambique, Namibia, Niger, South Africa, South Sudan, Tanzania, Togo, Zambia, Zimbabwe.

Habitat and ecology: Semi-arboreal, often sheltering under loose bark and in cracks in trees. Occurs mainly in Savanna, up to elevations of 1 200 m a.s.l. (Broadley 1990a; Branch 1998; Broadley & Hughes 2000). *Habitat*: Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread species and large parts of the range are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Hemirhagerrhis nototaenia, Hoedspruit, Limpopo province (© D.W. Pietersen).

Hemirhagerrhis nototaenia, Gravelotte, Limpopo province (© C.R. Hundermark).

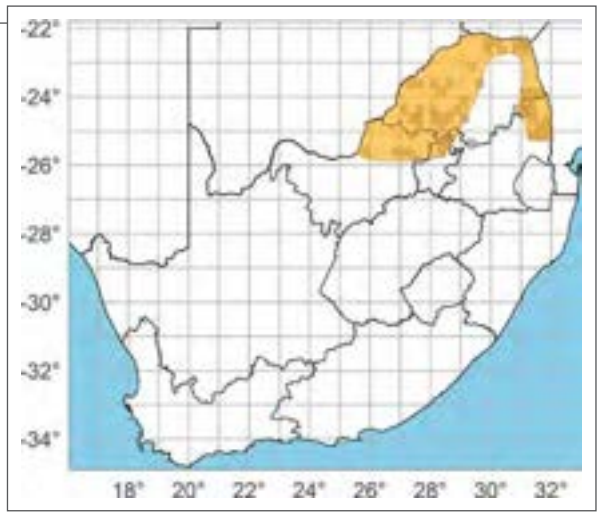
Family **Psammophiidae**

Psammophis angolensis (Bocage, 1872)

Dwarf Sand Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Although apparently of rare occurrence, this species is widespread in South Africa and elsewhere in Africa, with no known substantial threats.

Taxonomic notes: No notable issues. *Other important names*: none.

Distribution: Widespread across most of sub-Saharan Africa (Broadley 2002). Occurs in the northeastern parts of South Africa, throughout Limpopo province extending into North West, Gauteng and northern Mpumalanga provinces. There is a distribution gap along the northern Drakensberg escarpment and an isolated locality recorded from western Mpumalanga province. *EOO*: 190 000 km^2; *Distribution*: 129 000 km^2.

Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in Mesic Woodland Savanna, sheltering under stones (Jacobsen 1989). *Habitat*: Savanna.

Threats: Although there is habitat loss across parts of its range in South Africa, much of the distribution is within protected areas.

Population trend: The extent of habitat transformation is small in relation to the large range of this species. It is thus assumed that any local population declines do not pose a risk to this snake.

Conservation and research recommendations: No recommendations.

Psammophis angolensis, Goro, Limpopo province (© R.I. Stander).

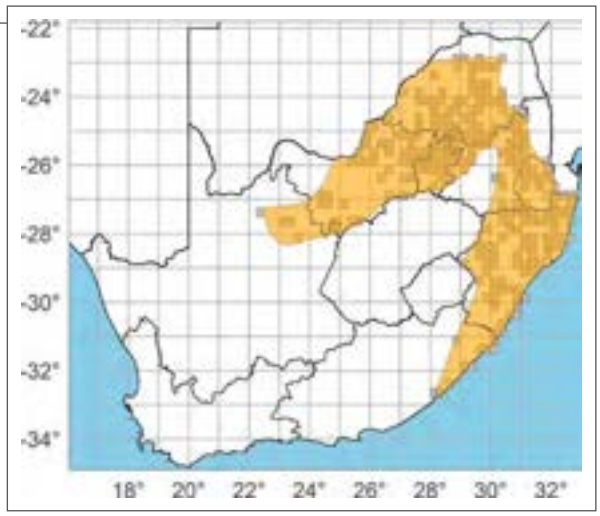
Family **Psammophiidae**

Psammophis brevirostris Peters, 1881

Short-snouted Grass Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: From southeastern Botswana and southwestern Zimbabwe through much of eastern South Africa. There is an apparently disjunct subpopulation in eastern Zimbabwe, possibly extending into neighbouring parts of Mozambique (Broadley 2002). Regionally, it is widespread in Eswatini and northern and eastern South Africa, extending marginally into the Eastern Cape province and the eastern Northern Cape province. *EOO*: 668 000 km^2; *Distribution*: 369 000 km^2.

Countries of occurrence: Botswana, Eswatini, South Africa, Zimbabwe.

Habitat and ecology: Occurs in various habitat types from coastal regions to higher elevations in the Drakensberg and eastern Zimbabwe. Shelters in holes in the ground, under rocks and in old termitaria (Jacobsen 1989). *Habitat*: Grassland, Savanna.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species with large portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the isolated subpopulation in eastern Zimbabwe should be assessed.

Psammophis brevirostris, Cato Ridge, KwaZulu-Natal province (© T. Ping).

Psammophis brevirostris, Pretoria, Gauteng province (© L. Verburgt).

Family **Psammophiidae**

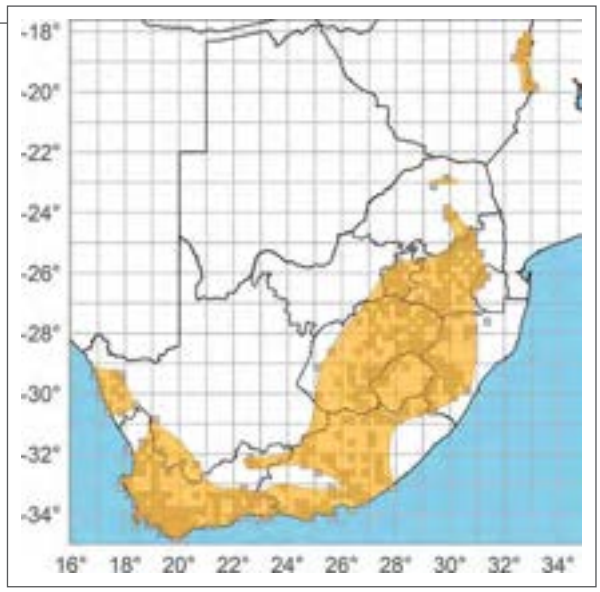
Psammophis crucifer (Daudin, 1803)

Cross-marked Whip Snake

Regional near-endemic

LC – Least Concern (Global)

Assessor: Maritz, B.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: Although there is colour polymorphism across the range, this does not appear to reflect species-level differentiation (see Kelly et al. 2008). *Other important names*: none.

Distribution: Widespread across the temperate parts of South Africa, although there are distribution gaps along the west coast and the arid interior of the country and the central Eastern Cape province. It extends along the Great Escarpment in the south, and also into western Lesotho and northern Eswatini with scattered records in northern Limpopo province near the Soutpansberg. Isolated historical records from Ithala Nature Reserve in northern KwaZulu-Natal province have not been reconfirmed in recent years. There is an isolated subpopulation in the highlands of eastern Zimbabwe and adjacent Mozambique (Broadley 2002; Broadley & Blaylock 2013). *EOO*: 1 545 000 km^2; *Distribution*: 526 300 km^2.

Countries of occurrence: Eswatini, Lesotho, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: This species occurs in a variety of habitats including Fynbos, Succulent Karoo and high-elevation Grasslands, ranging from sea level to 3 000 m a.s.l. (Branch 1998). Shelters under rocks on soil, in old termitaria and occasionally in rock crevices or low-growing shrubs (Jacobsen 1989). *Habitat*: Grassland, Shrubland.

Threats: No significant threats.

Population trend: The population size is assumed to be stable because this is a widespread and common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Psammophis crucifer, Makhanda, Eastern Cape province (© C. Keates).

Psammophis crucifer, Dullstroom, Mpumalanga province (© D.W. Pietersen).

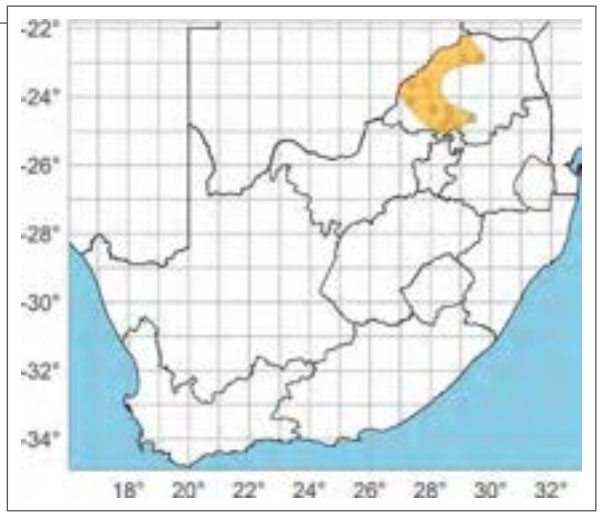
Family **Psammophiidae**

Psammophis jallae Peracca, 1896

Jalla's Sand Snake

NT – Near Threatened C2a(i) (Regional)

Assessors: Tolley, K.A., Alexander, G.J., Weeber, J., Pietersen, D.W., Conradie, W.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Reason for recent change: Genuine.

Assessment rationale: Although there are a fair number of records for this species across its global range, almost all records are historical. Within the global distribution, it has been recorded only five times since the year 2000 and has not been recorded in South Africa since the 1980s. Although the historical records suggest the range in South Africa was moderate in size, the lack of observations over the last 40 years suggests both the EOO and the population are in decline regionally and possibly globally. The generation length is however, not known nor is the timing of the population decline, so there is uncertainty regarding the population size reduction, but it is suspected to be significant. Given the uncertainty, a precautionary approach has been taken and the species is considered Near Threatened under criterion C as there are likely to be fewer than 10 000 individuals in the region with no subpopulation having more than 1 000 individuals. There is no evidence to suggest that immigration is occurring from outside the region. Therefore, the regional status was not amended by taking the global population into account.

Taxonomy: No taxonomic issues. *Other important names*: none.

Distribution: Occurs across central southern Africa from central Angola to northeastern South Africa. Regionally, all records are from western Limpopo

Psammophis jallae, Kasane, Botswana (© S. Spawls).

province (Broadley 2002). However, all verifiable records from South Africa are historical and date back to the 1980s and earlier. The regional interpreted distribution and EOO have been estimated from historical records but is now likely to be significantly reduced. *EOO*: 60 000 km^2; *Distribution*: 40 400 km^2.

Countries of occurrence: Angola, Botswana, Namibia, South Africa, Zambia, Zimbabwe.

Habitat and ecology: Occurs in Grassland and Woodland habitats between 750 and 1 500 m a.s.l. elevation (Broadley 2002). *Habitat*: Grassland, Savanna.

Threats: There is some habitat transformation within the distribution, but whether this is the cause of the inferred population decline is unclear.

Population trend: Although Maritz et al. (2020) considered the species to be widespread and locally common, there are very few recent records from anywhere within its distribution. Globally, the species has been recorded just five times since 2000: from Angola (one record: Port Elizabeth Museum), Botswana (one record: ReptileMap: 165837) and Zambia (three records: iNaturalist: 19776094; ReptileMap: 175506, 176668). It has not been recorded in South Africa since the 1980s, and this is suspected to represent a regional population decline. The degree of this decline is not known but may be significant.

Conservation and research recommendations: Targeted surveys of this species in South Africa and across the global distribution are essential to assess the inferred decline in population size and/or EOO.

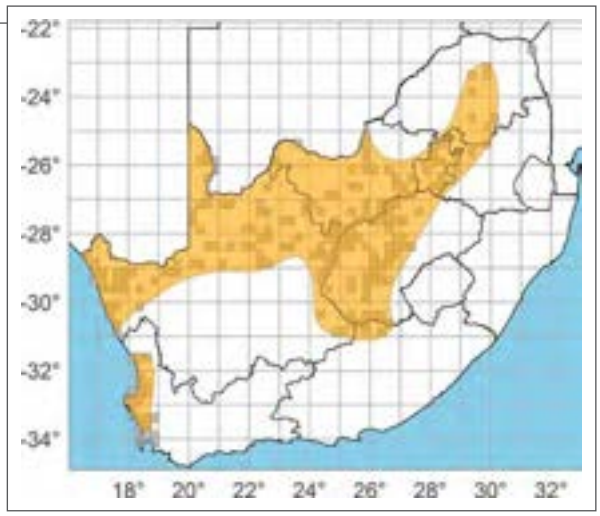
Family **Psammophiidae**

Psammophis leightoni Boulenger, 1902

Variable Sand Snake

LC – Least Concern (Regional)

Assessors: Tolley, K.A., Alexander, G.J.



Previous Red List categories:

2021: Least Concern (Global IUCN assessment).
2018: Least Concern (Global IUCN assessment).
2017: Vulnerable (Global IUCN assessment).
2014: Vulnerable (SARCA).

Reason for recent change: Non-genuine.

Assessment rationale: This species is widespread and common and there are no substantial threats. A recent taxonomic change synonymising *P. namibensis* and *P. trinasalis* with *P. leightoni* has resulted in a large increase in known range and EOO. The EOO is likely to be in decline in the south of the range, as there is only one recent record from the Cape Town area and habitat transformation is heavy in that region. Despite the suspected decline in EOO, the range of this species is very large and the decline in EOO is unlikely to put the species at elevated extinction risk. Assessed as Vulnerable in 2017, *P. namibensis* and *P. trinasalis* have been subsequently synonymised with *P. leightoni*. *Psammophis leightoni* is now considered very widespread in areas that are not heavily impacted by habitat transformation.

Taxonomic notes: Broadley (2002) elevated *P. leightoni namibensis* and *P. l. trinasalis* to species status, rendering *P. leightoni* a monotypic species. These

Psammophis leightoni, West Coast National Park, Western Cape province (© T. Ping).

subspecies are not clearly differentiated morphologically, and a recent phylogenetic analysis shows that these three taxa belong to a single species. These have been synonymised under the name *P. leightoni*, which takes precedence (Taft et al. 2022). *Other important names*: *Psammophis leightoni trinasalis*; *Psammophis leightoni namibensis*.

Distribution: Occurs across South Africa, Namibia, Botswana, and into southwestern Angola (Jacobsen 1989; Branch 1998; Marques et al. 2018; Taft et al. 2022). In South Africa, it occurs mainly across the northern arid regions, and along the west coast, extending into the southwestern Cape region. There is an apparent distribution gap along the west coast. The southwestern extent represents *P. leightoni* in the former sense, while the northwest represents *P. namibensis* and the north-central and northeast represent *P. trinasalis* in the former sense (Taft et al. 2022). *EOO*: 1 026 000 km^2; *Distribution*: 444 000 km^2.

Countries of occurrence: Angola, Botswana, Namibia, South Africa.

Habitat and ecology: Occurs in arid to semi-arid habitats such as sand Fynbos, Strandveld, Karoo and Savanna. *Habitat*: Savanna, Shrubland.

Threats: No significant threats.

Population trend: There may be local declines in the south of the range where habitat transformation is heavy. Nevertheless, the distribution is very large and mainly falls within areas that are not heavily transformed. Given this, and that the species can be locally common, the population is suspected to be stable.

Conservation and research recommendations: Observation records in the vicinity of Cape Town would allow for an improved evaluation of the suspected decline in EOO. The apparent distribution gap along the west coast requires verification through targeted surveys.

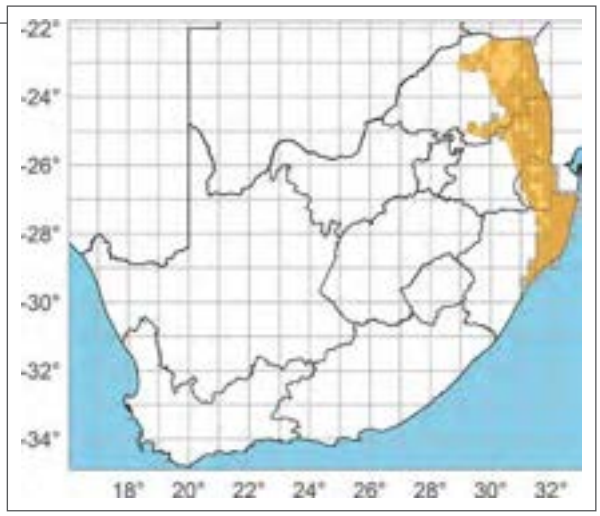
Family **Psammophiidae**

Psammophis mossambicus Peters, 1882

Olive Grass Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.



Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: Although a phylogenetic analysis suggested that *P. mossambicus* may be a junior synonym of *P. phillipsii* (Kelly et al. 2008), recent work has confirmed the validity of *P. mossambicus* as a distinct species and assigns all records of *P. phillipsii* in central Africa that are north, south and east of the Congo forest block to *P. mossambicus* and all records in West Africa to *P. phillipsii* (Trape et al. 2019). In his list of *P. mossambicus* material examined, Broadley (2002) mentions several additional localities in inland KwaZulu-Natal province, which are not reflected on his distribution map (e.g., Albert Falls Dam [2930 AD], Volksrust [2729 BD], Newcastle [2729 DD] and Umtamvuna Nature Reserve [3130 BA]), all of which fall outside of the current interpreted distribution for this species, but within the interpreted distribution of *P. brevirostris*. We surmise that Broadley (2002), after having examined these specimens, probably re-identified them as *P. brevirostris* and corrected the map but neglected to transfer these records to the correct species in his 'material examined' list. This assumption is lent credence by the lack of contemporary records of *P. mossambicus* in these areas. *Other important names*: *Psammophis phillipsii*.

Psammophis mossambicus, Quembo River, Angola (© W. Conradie).

Distribution: Occurs across southern, central and East Africa (Broadley 2002; Trape et al. 2019). Regionally, it occurs across the northeast from northern Limpopo province extending through Eswatini into coastal, central KwaZulu-Natal province. *EOO*: 190 000 km^2; *Distribution*: 111 000 km^2.

Countries of occurrence: Angola, Botswana, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Eswatini, Gabon, Kenya, Malawi, Mozambique, Namibia, Nigeria, Republic of the Congo, Rwanda, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Savannas and Grasslands from sea level to over 1 500 m a.s.l. across the global distribution, although recorded only up to about 1 000 m a.s.l. in the region. It is often associated with moist habitats (Broadley 2002). *Habitat*: Grassland, Savanna.

Threats: There are no known substantial threats to this species.

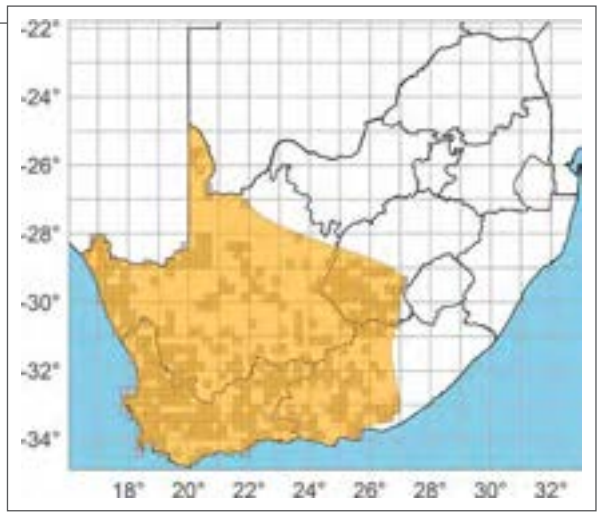
Population trend: The population size is assumed to be stable because this is a widespread and abundant species that occurs in some areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Family **Psammophiidae**

Psammophis notostictus Peters, 1867

Karoo Sand Snake, Karoo Whip Snake



LC – Least Concern (Regional)

Assessor: Maritz, B.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomy: No taxonomic issues. *Other important names*: none.

Distribution: Widespread in the western half of southern Africa, from southern Angola through Namibia to South Africa (Broadley 2002). In South Africa it is widespread across the semi-arid and arid western regions. *EOO*: 788 000 km²; *Distribution*: 609 000 km².

Countries of occurrence: Angola, Botswana, Namibia, South Africa.

Habitat and ecology: Arid Scrubland, Karroid Bushveld and Fynbos habitats. Takes refuge in old termitaria and under rocks (De Waal 1978). *Habitat*: Savanna, Shrubland.

Threats: There are no known substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species that occurs in some areas that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Psammophis notostictus, Velddrif, Western Cape province (© T. Ping).

Psammophis notostictus, Hondeklipbaai, Northern Cape province (© C. Keates).

Family **Psammophiidae**

Psammophis subtaeniatus Peters, 1882

Western Stripe-bellied Sand Snake

LC – Least Concern (Regional)

Assessor: Maritz, B.

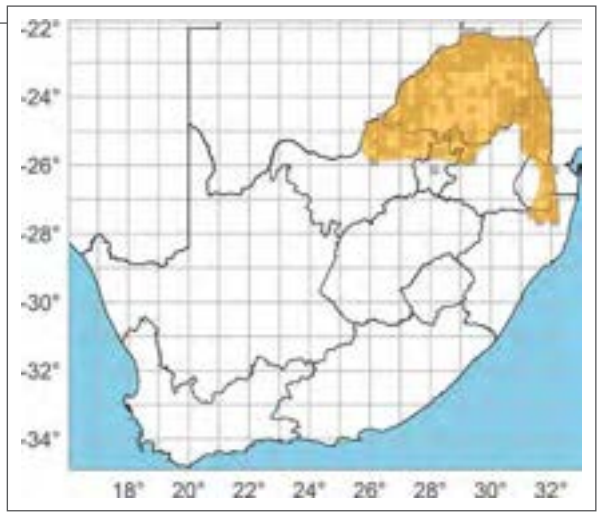
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs across most of southern Africa (Branch 1998; Broadley 2002). In South Africa it occurs throughout the northeast, extending into parts of North West, Gauteng and KwaZulu-Natal provinces. A historical record from 1989 from Johannesburg is considered valid, but is not currently within the interpreted distribution, as no additional observations have been made in the area. *EOO*: 272 000 km^2; *Distribution*: 194 000 km^2.

Countries of occurrence: Angola, Botswana, Eswatini, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.



Habitat and ecology: Takes refuge in rock crevices and moribund termitaria or under bark and in bushes (Jacobsen 1989) in Woodland habitats from 100 to 1 500 m a.s.l. (Broadley 2002). *Habitat*: Savanna.

Threats: There are no known substantial threats.

Population trend: The population size is assumed to be stable because this is a widespread species with large parts of the range that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Psammophis subtaeniatus, Blouberg, Limpopo province (© R.I. Stander).

Psammophis subtaeniatus, Tshipise, Limpopo province (© C. Keates).

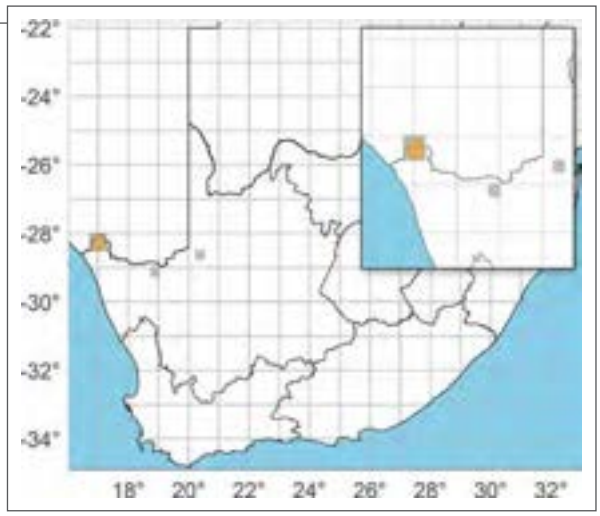
Family **Psammophiidae**

Psammophis trigrammus Günther, 1865

Western Sand Snake

LC – Least Concern (Regional)

Assessors: Maritz, B., Bates, M.F.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: There are no significant threats in South Africa, where much of the range is protected within the Richtersveld National Park.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs in the western parts of southern Africa, extending peripherally into the arid northwest region of South Africa (Broadley 2002; Bauer & Branch 2003 [2001]). A recent virtual museum record from Augrabies Falls National Park (ReptileMap: 162974) suggests that it may be more widespread along the lower Orange River. *EOO*: 1 360 km²; *Distribution*: 1 330 km².

Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: Rocky patches on sandy soil near river valleys at low elevations (<320 m a.s.l.; Bauer & Branch 2003 [2001]). *Habitat*: Desert, Shrubland.

Threats: There are no known substantial threats to this species, but it occurs in an area that has been impacted by long-term drought and this, along with climate change, may be an emerging threat.

Population trend: Anecdotal observations of vertebrate species in this area possibly suggest there may have been recent population declines for many species due to long-term drought (P. van Wyk, pers. comm. 2021). It is unknown if the population of this snake has also undergone a decline.

Conservation and research recommendations: Research on the response of this snake to climate change and drought is needed.

Psammophis trigrammus, Langer-Heinrich Uranium Mine, Namibia (© W. Conradie).

Family **Psammophiidae**

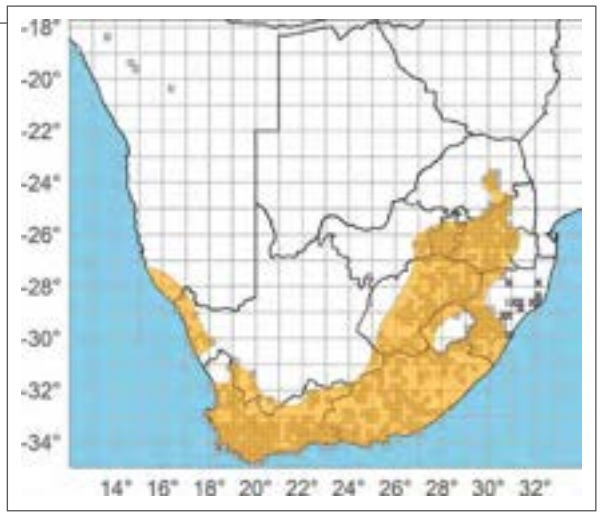
Psammophylax rhombeatus (Linnaeus, 1758)

Spotted Skaapsteker

Regional near-endemic

LC – Least Concern (Global)

Assessors: Conradie, W., Alexander, G.J., Tolley, K.A., Weeber, J., Pietersen, D.W.



Previous Red List categories:
2014: Least Concern as *Psammophylax rhombeatus rhombeatus* (SARCA).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: *Psammophylax rhombeatus ocellatus* was recently elevated to full species (Branch et al. 2019c). The apparently isolated population of *P. rhombeatus* in coastal, northwestern South Africa requires additional investigation. *Other important names*: none.

Distribution: This species is widespread in South Africa, although it is absent from the arid central and western regions and the low-lying eastern Lowveld and northern Bushveld. It extends into Eswatini, Lesotho and southern Namibia. Scattered records in northern Namibia (Broadley 1983; Branch 1998; Griffin 2003) require verification. The spatial distribution of records along the west coast suggests there may be a distribution gap at the Knersvlakte. Additional outlying records,

Psammophylax rhombeatus, Buffelskloof Private Nature Reserve, Mpumpalanga province (© L. Verburgt).

Family **Psammophiidae**

Psammophylax rhombeatus, Franklin, KwaZulu-Natal province (© W. Conradie).

Psammophylax rhombeatus, Op-die-Berg, Western Cape province (© C. & S. Dorse).

especially from central KwaZulu-Natal province, are based on historical literature records (Jacobsen 1989; Masterson 2014d), and the last time this species was recorded from that area was two decades ago. Given there are quite a few historical records, but no recent records, it is possible that the range has contracted in this area. The area is not included in the estimate of EOO, nor are the records from northern Namibia. *EOO*: 1 315 000 km^2; *Distribution*: 564 000 km^2.

Countries of occurrence: Eswatini, Lesotho, Namibia, South Africa.

Habitat and ecology: Occurs in a variety of arid and mesic habitats from sea level to about 2 300 m a.s.l. Shelters under rocks on soil, in rock crevices, old termitaria and holes in the ground (De Waal 1978; Jacobsen 1989; Broadley 1990a; Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no known substantial threats to this species, although the area where the range seems to have contracted is heavily transformed.

Population trend: The EOO appears to have undergone a proportionally small decline in extent as compared to the overall distribution, and this suggests there has been some population decline. However, because the distribution is large, the decline is unlikely to pose a significant risk to the species.

Conservation and research recommendations: The potential gap along the west coast requires verification through targeted surveys. The possibility of a range contraction requires further investigation.

Psammophylax rhombeatus, Noup, Northern Cape province (© G. Alexander).

Family Psammophiidae

Psammophylax tritaeniatus (Günther, 1868)

Striped Skaapsteker

LC – Least Concern (Regional)

Assessors: Maritz, B., Masterson, G.

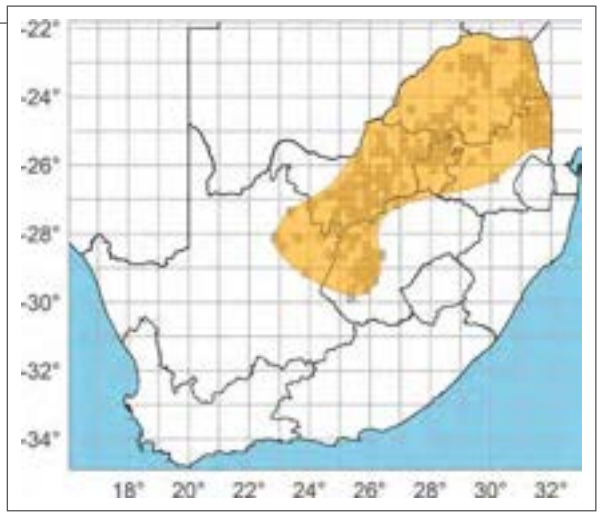
Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2011: Least Concern (Global IUCN assessment).

Assessment rationale: Widespread and common with no known substantial threats.

Taxonomic notes: A phylogenetic analysis confirms that the former subspecies *P. tritaeniatus subniger* and *P. tritaeniatus vanoyei* from the Democratic Republic of the Congo should be treated as junior synonyms of *P. variabilis* as proposed by Broadley (1977b), but see Keates et al. (2019), while the status of the subspecies *P. tritaeniatus fitzgeraldi* (Broadley 1960) from Zambia has not yet been resolved. *Other important names*: *Psammophylax tritaeniatus fitzgeraldi*.

Distribution: Occurs throughout southern Africa extending northeastwards into Tanzania (Broadley 1990a). In South Africa, it is distributed in the northeast,

Psammophylax tritaeniatus, Steelpoort region, Mpumalanga province (© G. Alexander).



extending southwestwards into the North West and Free State provinces. Historical records from the Northern Cape province to the west of the range were questioned by Masterson (2014e), but recent citizen science records from the area (Reptile Map: 157699 and 167801) suggest that the species does occur there. *EOO*: 419 000 km²; *Distribution*: 345 000 km².

Countries of occurrence: Angola, Botswana, Democratic Republic of the Congo, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Occurs in open Woodland and shrubby habitats (Broadley 1990a) at elevations between 200 and 1 600 m a.s.l. It is terrestrial, taking refuge under rocks and in moribund termitaria (De Waal 1978; Jacobsen 1989). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no known substantial threats to this species.

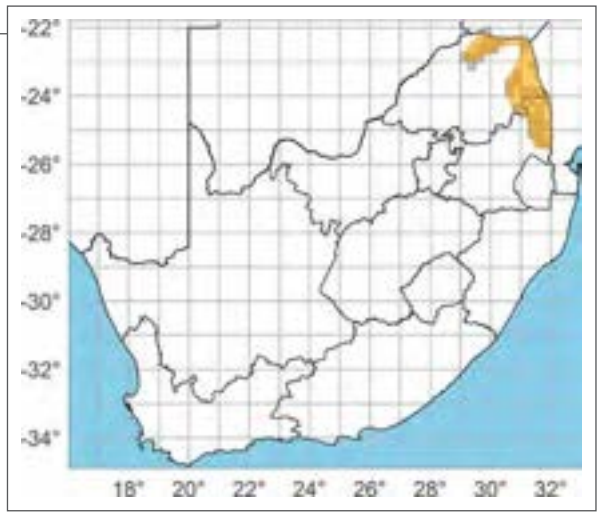
Population trend: The population size is assumed to be stable because this is a widespread species with large parts of the range that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Family **Psammophiidae**

Rhamphiophis rostratus Peters, 1854

Rufous Beaked Snake



LC – Least Concern (Regional)

Assessors: Maritz, B., Masterson, G.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and well protected within South Africa, primarily within the Kruger National Park.

Taxonomic notes: No taxonomic issues. *Other important names*: none.

Distribution: Occurs across most of southern and East Africa (Broadley 1990a). In South Africa it has a limited distribution in the northeast, through northern and eastern Limpopo and eastern Mpumalanga provinces. *EOO*: 62 000 km²; *Distribution*: 37 100 km².

Countries of occurrence: Botswana, Ethiopia, Kenya, Malawi, Mozambique, Namibia, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Habitat and ecology: Terrestrial, taking refuge in rodent burrows and termite mounds (Broadley 1990a; Branch 1998). *Habitat*: Savanna.

Threats: There are no substantial threats to this species.

Population trend: Despite the small geographic range in the region, the species occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: No recommendations.

Rhamphiophis rostratus, Chiawa, Zambia (© W. Conradie).

Family **Prosymnidae**

Prosymna bivittata Werner, 1903

Two-striped Shovel-snout

LC – Least Concern (Regional)

Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread, with no known substantial threats.

Taxonomic notes: Zaher et al. (2019) placed *P. bivittata* in the newly erected family Prosymnidae. No additional taxonomic issues. *Other important names*: none.

Distribution: Occurs across the central areas of southern Africa (Broadley 1990a). In South Africa, it is widespread across the northern parts of the country from the northwest margin extending across to the Mozambique border, with scattered records in northern KwaZulu-Natal province. There are historical records from the eastern Lowveld, but the species has not been recorded from that area since 1987. Although not yet recorded in Eswatini or Mozambique, it is likely to occur in both these countries. Previous records of *P. bivittata* from coastal KwaZulu-Natal province (Marais 2014b) were erroneously transcribed from the source and are referable to *P. janii* (Bourquin 2004). *EOO*: 747 000 km²; *Distribution*: 325 000 km².

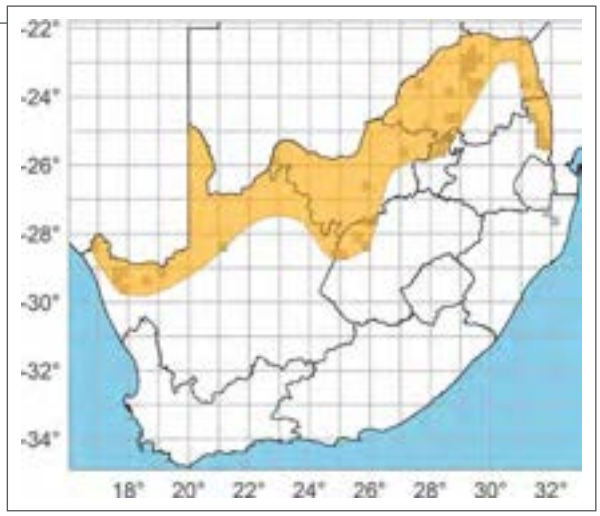
Countries of occurrence: Botswana, Namibia, South Africa, Zimbabwe.

Habitat and ecology: Occurs under rocks resting on soil and under logs in sparse Thornveld, Karroid and Sandveld habitats at elevations of 200–1 400 m a.s.l. (Jacobsen 1989; Broadley 1990a; Branch 1998). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no known substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and fairly common species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: No recommendations.



Prosymna bivittata, Soutpansberg, Limpopo province (© M. Petford).

Prosymna bivittata, Pontdrift, Limpopo province (© L. Verburgt).

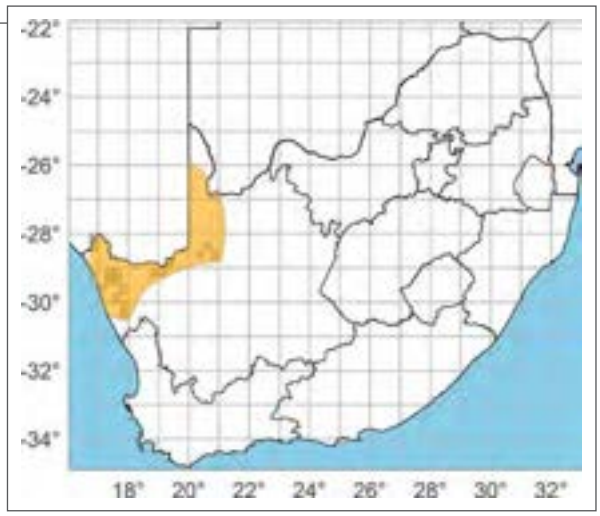
Family **Prosymnidae**

Prosymna frontalis (Peters, 1867)

South-western Shovel-snout

LC – Least Concern (Regional)

Assessors: Maritz, B., Marais, J.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: This species is fairly widespread and common with no known substantial threats.

Taxonomic notes: Zaher et al. (2019) placed *P. frontalis* in the newly erected family Prosymnidae. Recent phylogenetic analyses suggest that there are multiple cryptic species within this taxon (Heinicke et al. 2020). *Other important names*: none.

Distribution: From southern Angola, southwards to the northern parts of the Northern Cape province in South Africa (Broadley 1990a). In South Africa, it occurs along the western coastal margin and along or near the Orange River Valley. *EOO*: 138 000 km²; *Distribution*: 67 500 km².

Countries of occurrence: Angola, Namibia, South Africa.

Habitat and ecology: Occurs in arid areas with rocky substrates (Broadley 1990a; Branch 1998). *Habitat*: Desert, Savanna, Shrubland.

Threats: No known substantial threats.

Population trend: In spite of the small regional geographic range in South Africa, this species occurs in an area where there has been little habitat transformation. Population size is thus assumed to be stable.

Conservation and research recommendations: The taxonomic status of possible cryptic species requires evaluation.

Prosymna frontalis, Springbok, Northern Cape province (© C.R. Hundermark).

Family **Prosymnidae**

Prosymna janii Bianconi, 1862

Mozambique Shovel-snout

LC – Least Concern (Regional)

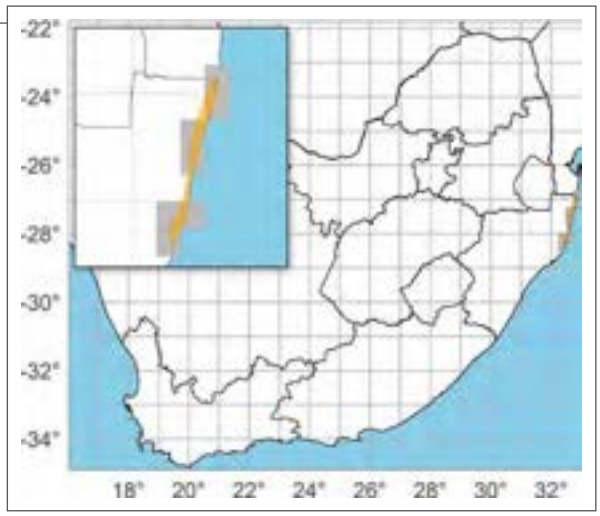
Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Has a small range regionally, but is locally abundant with no major threats, as nearly 70% of the distribution in South Africa falls within the iSimangaliso Wetland Park, a UNESCO World Heritage Site. Nevertheless, there is an emerging threat of socioeconomically driven land invasion into the protected area by local communities, and this should be monitored. If this threat becomes active and given the relatively small EOO, most of which falls within the protected area, this species could rapidly become threatened.

Taxonomic notes: Zaher et al. (2019) placed *P. janii* in the newly erected family Prosymnidae. There are no taxonomic issues. *Other important names*: none.

Distribution: Occurs in coastal areas of northeastern KwaZulu-Natal province, South Africa, northwards into southern Mozambique (Broadley 1990a). *EOO*: 2 250 km^2; *Distribution*: 1 480 km^2.



Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Inhabits loose, sandy soil in Coastal Dune Forest, Coastal Forest and Woodland (Broadley 1990a). *Habitat*: Forest.

Threats: There are no known substantial threats to this species. The majority of the South African range falls within iSimangaliso Wetland Park and World Heritage Site, but despite the official protection status, the park has become vulnerable to the threat of socioeconomically driven land invasion by local communities. Given that other protected areas in South Africa recently have been de-gazetted due to land invasions in favour of informal human settlement (e.g., Western Cape Government 2022), this is a plausible emerging threat.

Population trend: Because most of the regional geographic range of this species is within protected areas, the population size is assumed to be stable.

Conservation and research recommendations: Given the emerging threat of socioeconomically driven land invasion by local communities within protected areas where this species primarily occurs, changes in land use and potential rapid habitat destruction will require careful monitoring.

Prosymna janii, Cape Vidal, KwaZulu-Natal province (© G. Alexander).

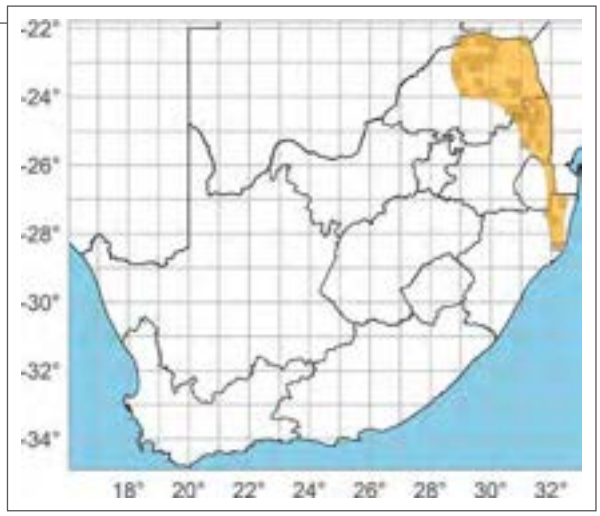
Family **Prosymnidae**

Prosymna lineata (Peters, 1871)

Lined Shovel-snout

LC – Least Concern (Regional)

Assessors: Maritz, B., Marais, J.



Previous Red List categories:
2020: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread with no known substantial threats.

Taxonomic notes: Zaher et al. (2019) placed *P. lineata* in the newly erected family Prosymnidae. No taxonomic issues. *Other important names*: *Prosymna sundevalli lineata*.

Distribution: Occurs in eastern southern Africa, extending to northeastern South Africa (Broadley 1990a). Regionally, it is distributed from northern Limpopo province southwards to northern KwaZulu-Natal province (e.g., Van Huyssteen & Jordaan 2021), with only a single historical record (1980) from Eswatini. The two areas in South Africa where it occurs are presumably linked through Mozambique. *EOO*: 138 000 km²; *Distribution*: 88 500 km².

Countries of occurrence: Botswana, Eswatini, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Inhabits Sandveld and Woodland (Broadley 1990a), at elevations between 300 and 1 400 m a.s.l., where it shelters under rocks and rotting logs (Jacobsen 1989). *Habitat*: Savanna.

Threats: There is some loss in habitat quality and extent across parts of the range.

Population trend: The extent of habitat transformation is small in relation to the large range of this species. It is thus assumed that any local population declines do not pose a threat to the species.

Conservation and research recommendations: No recommendations.

Prosymna lineata, Pafuri, Limpopo province (© C. Keates).

Family **Prosymnidae**

Prosymna stuhlmanni (Pfeffer, 1893)

East African Shovel-Snout

LC – Least Concern (Regional)

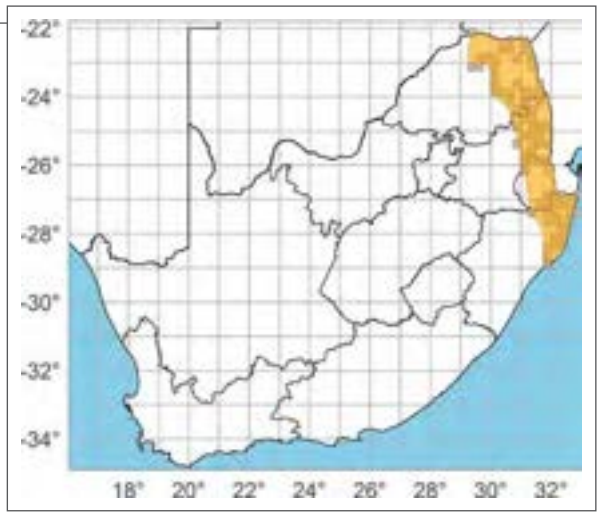
Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Fairly widespread and common, with no known substantial threats.

Taxonomic notes: Zaher et al. (2019) placed *P. stuhlmanni* in the newly erected family Prosymnidae. Recent phylogenetic analyses suggest that there might be some cryptic species within this taxon (Heinicke et al. 2020). *Other important names*: none.

Distribution: Widespread across the more mesic parts of southern Africa, extending from northern South Africa through East Africa to central Kenya (Spawls et al. 2018). Regionally, it occurs in the north-east from northern Limpopo province into central KwaZulu-Natal province. There are records from northern and southern Eswatini, but there appears to be a distribution gap in central Eswatini. It might also occur in eastern Botswana (Auerbach 1987). An isolated record from western Limpopo province (Broadley 1980) was incorrectly georeferenced and is from western Soutpansberg. *EOO*: 137 000 km²; *Distribution*: 93 900 km².



Prosymna stuhlmanni, Hoedspruit, Limpopo province (© D.W. Pietersen).

Countries of occurrence: Eswatini, Kenya, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe.

Habitat and ecology: Lowland Forest and Woodlands (Branch 1998; Marais 2004). Mainly fossorial, occurring under rocks and rotting logs, in decaying plant matter and deserted termite mounds (Jacobsen 1989; Marais 2004). *Habitat*: Forest, Savanna.

Threats: There are no known substantial threats.

Population trend: Because much of the regional geographic range of this species is in protected areas, the population size is assumed to be stable.

Conservation and research recommendations: No recommendations.

Family **Prosymnidae**

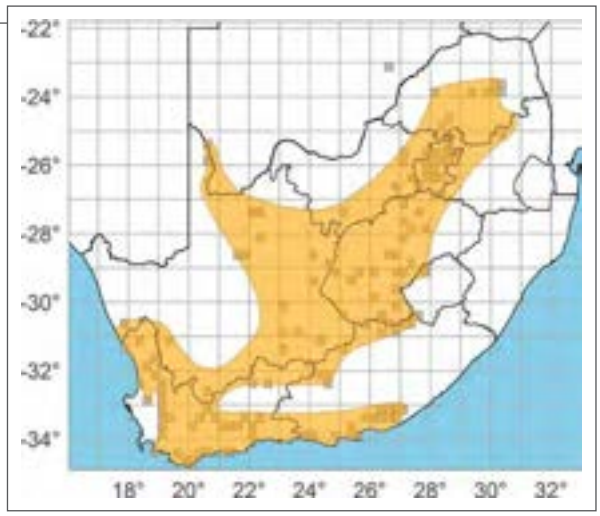
Prosymna sundevallii (Smith, 1849)

Sundevall's Shovel-snout

Regional near-endemic

LC – Least Concern (Global)

Assessors: Maritz, B., Marais, J.



Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: Zaher et al. (2019) placed *P. sundevallii* in the newly erected family Prosymnidae. *Other important names*: *Prosymna sundevalli sundevalli*.

Distribution: Occurs across most of South Africa, western Lesotho and southeastern Botswana (Broadley 1980), although it is absent from the arid interior of South Africa, KwaZulu-Natal province and large parts of the Eastern Cape and Mpumalanga provinces. There is a record from eastern Botswana (Broadley 1980) that requires verification and has not been included in the EOO or distribution estimates. *EOO*: 1 140 000 km^2; *Distribution*: 579 500 km^2.

Countries of occurrence: Botswana, Lesotho, South Africa.

Habitat and ecology: Occurs in Fynbos and Mesic Thicket in the south, and elsewhere in moist and dry Savanna and karroid areas where it shelters in old termitaria and under rocks (Broadley 1980). *Habitat*: Grassland, Savanna, Shrubland.

Threats: There are no major threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and common species with large parts of the distribution that are not impacted by habitat transformation.

Conservation and research recommendations: No recommendations.

Prosymna sundevallii, Alicedale, Eastern Cape province (© C. Keates).

Prosymna sundevallii, Elandsbaai, Western Cape province (© C. & S. Dorse).

Family **Pseudaspididae**

Pseudaspis cana (Linnaeus, 1758)

Mole Snake

LC – Least Concern (Regional)

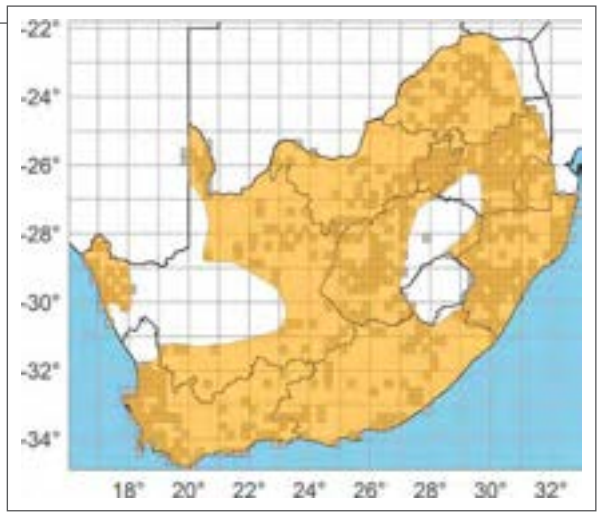
Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common, with no known substantial threats.

Taxonomic notes: Zaher et al. (2019) placed *P. cana* in a newly erected family, the Pseudaspididae. Males of the brown phase of this species from northern Namibia have much shorter and morphologically different hemipenes compared to specimens of the larger black phase in the Western and Northern Cape provinces of South Africa (Visser 2010). This morphologically divergent form could correspond to the subspecies *P. cana anchietae* (Bocage 1882) described from Angola, although that subspecies is currently not recognised. *Other important names*: none.

Distribution: Occurs throughout most of southern and East Africa (Broadley 1990a). In the region, the species is widespread in South Africa and Eswatini, although there are large distribution gaps in the arid central regions of South Africa and across Lesotho. *EOO*: 1 533 000 km²; *Distribution*: 1 016 000 km².



Countries of occurrence: Angola, Botswana, Burundi, Democratic Republic of the Congo, Eswatini, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Zambia, Zimbabwe.

Pseudaspis cana, juvenile colouration, Lephalale, Limpopo province (© L. Verburgt).

Family **Pseudaspididae**

Pseudaspis cana, Durbanville, Western Cape province (© T. Ping).

Pseudaspis cana, Midrand, Gauteng province (© C.R. Hundermark).

Habitat and ecology: Occupies a variety of habitats, ranging from mountainous areas to desert regions (Broadley 1990a), but not Forest. Particularly common in sandy, scrub-covered areas and Grasslands, where it spends most of its time underground in animal burrows (Broadley 1990a; Branch 1998). *Habitat*: Desert, Grassland, Savanna, Shrubland.

Threats: There are no substantial threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread and abundant species with large portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: An investigation of the taxonomy of the previously described Namibian/Angolan subspecies is needed to assess its validity.

Family **Pseudoxyrhophiidae**

Amplorhinus multimaculatus Smith, 1847

Many-spotted Snake

Regional near-endemic

LC – Least Concern (Global)

Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2018: Least Concern (Global IUCN assessment).
2017: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).

Assessment rationale: Widespread and common throughout its range, with no major threats.

Taxonomic notes: The Zimbabwean subpopulation is geographically isolated from the nearest South African subpopulation and there is substantial genetic divergence between these subpopulations (Kelly et al. 2009). Subpopulations may also exist within South Africa (southwestern and eastern), but this has not been investigated in a phylogenetic context. *Other important names*: none.

Distribution: Occurs across the southern and eastern South African escarpment and Lesotho, with an isolated population on the eastern highlands of Zimbabwe and adjacent Mozambique (Broadley 1990a). Occurrence appears to be patchy throughout the distribution.

Amplorhinus multimaculatus, Letseng, Lesotho (© L. Verburgt).

Family **Pseudoxyrhophiidae**

Amplorhinus multimaculatus, Belfast, Mpumalanga province (© L. Verburgt).

Amplorhinus multimaculatus, Hottentots Holland, Western Cape province (© C. & S. Dorse).

Historical records from Irene in Gauteng province, South Africa (Jacobsen 1989) have not been verified in recent years although new records were recently collected 100 km to the east. Records reported in Marais (2014c) for central KwaZulu-Natal province are locality transcription errors and those in northern KwaZulu-Natal province were errors in taxon assignment (Bourquin 2004). *EOO*: 941 400 km^2; *Distribution*: 126 400 km^2.

Countries of occurrence: Lesotho, Mozambique, South Africa, Zimbabwe.

Habitat and ecology: Occurs in reed beds, wetlands and riverine vegetation across several vegetation types (Broadley 1990a; Branch 1998; Broadley & Blaylock 2013). *Habitat*: Grassland, Shrubland, Wetlands.

Threats: There are no significant threats to this species.

Population trend: The population size is assumed to be stable because this is a widespread species with portions of the range that are not significantly impacted by habitat transformation.

Conservation and research recommendations: The taxonomic status of the Zimbabwe subpopulation, as well as the presumed subpopulations in South Africa, should be investigated.

Family **Pseudoxyrhophiidae**

Duberria lutrix (Linnaeus, 1758)

Common Slug-Eater

LC – Least Concern (Regional)

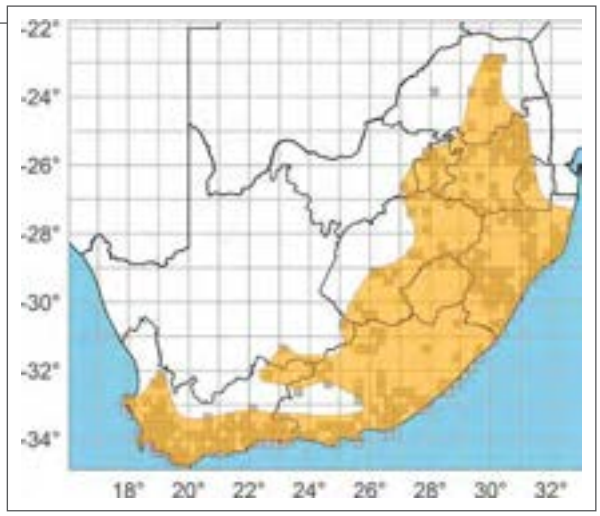
Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2010: Least Concern (Global IUCN assessment).

Subspecies assessed:
2014: *Duberria lutrix lutrix* – Least Concern (SARCA).

Assessment rationale: A widespread and common species with no major threats.

Taxonomic notes: Molecular phylogenetic studies suggest that most of the recognised subspecies (extending from the Cape of Africa to Ethiopia) represent distinct species, some of which have been elevated to full species (Broadley & Blaylock 2013) and others await formal elevation (Edwards et al. 2019). There is also cryptic diversity within *D. lutrix lutrix* and this may warrant further taxonomic adjustment (Kulenkampff et al. 2019; Edwards et al. 2019). *Other important names*: *Duberria lutrix abyssinica*; *Duberria lutrix atriventris*; *Duberria lutrix basilewskyi*; *Duberria lutrix currylindahli*; *Duberria lutrix lutrix*.



Distribution: Widespread across much of east and central Africa from South Africa to Ethiopia, although the distribution is patchy given that some subspecies

Duberria lutrix, Akkerdal, Baviaanskloof, Eastern Cape province (© W. Conradie).

Family **Pseudoxyrhophiidae**

Duberria lutrix, Hluleka Nature Reserve, Eastern Cape province (© W. Conradie).

Duberria lutrix, Woodbush Forest Reserve, Limpopo province (© L. Verburgt).

have been described as full species. In the region, it occurs in the mesic areas, extending from the south-western Cape eastwards along the margin of the continent, northeast to Limpopo province. There are a few scattered records from the Great Escarpment, and it has been recorded from northern Lesotho and western Eswatini. There is also an isolated record from the Waterberg, Limpopo province. *EOO*: 994 000 km^2; *Distribution*: 549 000 km^2.

Countries of occurrence: Democratic Republic of the Congo, Eswatini, Ethiopia, Kenya, Lesotho, Rwanda, South Africa, Tanzania, Uganda.

Habitat and ecology: Favours damp localities in a variety of different habitat types ranging from semi-arid to mesic. *Habitat*: Forest, Grassland, Shrubland.

Threats: No significant threats.

Population trend: The population is considered stable due to the widespread range and abundance of this species that mitigates against the negative effects of local population declines.

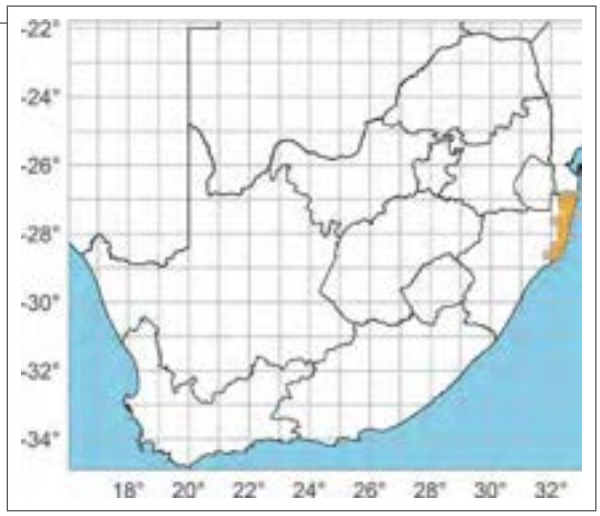
Conservation and research recommendations: Research into the taxonomic status of the currently recognised subspecies is needed.

Family **Pseudoxyrhophiidae**

Duberria variegata (Peters, 1854)

Variegated Slug-eater, Spotted Slug-eater

LC – Least Concern (Regional)



Assessors: Maritz, B., Marais, J.

Previous Red List categories:
2021: Least Concern (Global IUCN assessment).
2014: Least Concern (SARCA).
2010: Least Concern (Global IUCN assessment).

Assessment rationale: Although this species has a moderate-sized distribution it is locally abundant with no significant threats. Regionally, a large part of its range falls within protected areas, notably iSimangaliso Wetland Park, a UNESCO World Heritage Site.

Taxonomic notes: No taxonomic issues. *Other important names:* none.

Distribution: Restricted to the eastern extremes of South Africa and southern Mozambique, from northern KwaZulu-Natal province in the south to Inhambane, Mozambique, in the north (Broadley 1990a). *EOO:* 10 700 km^2; *Distribution:* 8 420 km^2.

Countries of occurrence: Mozambique, South Africa.

Habitat and ecology: Occurs in Lowland Coastal Forest (Branch 1998). *Habitat:* Forest.

Threats: There are no significant threats to this species, and it occurs largely within protected areas.

Population trend: Because much of the geographic range of this species is in protected areas the population size is assumed to be stable.

Conservation and research recommendations: None.

Duberria variegata, Cape Vidal, KwaZulu-Natal province (© G. Alexander).

Duberria variegata, St Lucia, KwaZulu-Natal province (© T. Ping).

4

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Appendices

Appendix 1

Summary of the five criteria (A–E) used to evaluate if a taxon belongs in an IUCN Red List threatened category (Critically Endangered, Endangered or Vulnerable)[1].

Pelomedusa subrufa (© N. Maury).

A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4	Critically Endangered	Endangered	Vulnerable
A1	**≥ 90%**	**≥ 70%**	**≥ 50%**
A2, A3 & A4	**≥ 80%**	**≥ 50%**	**≥ 30%**

A1. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased.

A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

A3. Population reduction projected, inferred or suspected to be met in the future (up to a maximum of 100 years). *[(a) cannot be used for A3]*

A4. An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality

(d) actual or potential levels of exploitation

(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)	Critically Endangered	Endangered	Vulnerable
B1. Extent of occurrence (EOO)	< 100 km²	< 5 000 km²	< 20 000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2 000 km²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented **OR** Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: **(i)** extent of occurrence; **(ii)** area of occupancy; **(iii)** area, extent and/or quality of habitat; **(iv)** number of locations or subpopulations; **(v)** number of mature individuals			
(c) Extreme fluctuations in any of: **(i)** extent of occurrence; **(ii)** area of occupancy; **(iii)** number of locations or subpopulations; **(iv)** number of mature individuals			

C. Small population size and decline	Critically Endangered	Endangered	Vulnerable
Number of mature individuals	< 250	< 2 500	< 10 000
AND at least one of C1 or C2:			
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2. An observed, estimated, projected or inferred continuing decline AND at least 1 of the following 3 conditions:			
(a) **(i)** Number of mature individuals in each subpopulation:	≤ 50	≤ 250	≤ 1 000
(ii) % of mature individuals in one subpopulation =	90–100%	95–100%	100%
(b) Extreme fluctuations in the number of mature individuals			

D. Very small or restricted population	Critically Endangered	Endangered	Vulnerable
D1. Number of mature individuals	< 50	< 250	< 1 000
D2. *Only applies to the VU category* Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time.	-	-	D2. typically: AOO < 20 km² or number of locations ≤ 5

E. Quantitative analysis	Critically Endangered	Endangered	Vulnerable
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

[1] Use of this summary sheet requires full understanding of the *IUCN Red List Categories and Criteria*, and *Guidelines for Using the IUCN Red List Categories and Criteria*. Please refer to both documents for explanations of terms and concepts used here.

Appendix 2

Species list of reptiles from South Africa, Eswatini and Lesotho and their threat status as of 2021.

All 410 reptile species that occur in the region are listed including peripheral, marine and introduced species with their current threat status indicated. Endemic and near-endemic species have global IUCN assessments, whereas the regional status is indicated for species that are not endemic. For peripheral species, the global IUCN status is given. Species are organised by taxonomic Orders, but squamate lizards and snakes are grouped separately. Families and species within families are alphabetical. EOO and distribution sizes are not given for peripheral species or Data Deficient species.

Agama hispida (© N. Maury).

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Crocodilia									
	Crocodylidae	*Crocodylus niloticus*	Not endemic	Not endemic	Regional	VU	A2ac	324 000	145 000
Testudines									
	Cheloniidae	*Caretta caretta*	Peripheral	Peripheral	Global	VU	A2b		
	Cheloniidae	*Chelonia mydas*	Peripheral	Peripheral	Global	EN	A2bd		
	Cheloniidae	*Eretmochelys imbricata*	Peripheral	Peripheral	Global	CR	A2bd		
	Cheloniidae	*Lepidochelys olivacea*	Peripheral	Peripheral	Global	VU	A2bd		
	Dermochelyidae	*Dermochelys coriacea*	Peripheral	Peripheral	Global	VU	A2bd		
	Pelomedusidae	*Pelomedusa galeata*	Near-endemic	Near-endemic	Global	LC		1 100 900	778 000
	Pelomedusidae	*Pelomedusa subrufa*	Not endemic	Not endemic	Regional	LC		155 000	109 000
	Pelomedusidae	*Pelusios castanoides*	Not endemic	Not endemic	Regional	VU	A4ac	7 500	5 400
	Pelomedusidae	*Pelusios rhodesianus*	Not endemic	Not endemic	Regional	VU	A4ace	4 500	3 200
	Pelomedusidae	*Pelusios sinuatus*	Not endemic	Not endemic	Regional	LC		295 000	182 000
	Pelomedusidae	*Pelusios subniger*	Not endemic	Not endemic	Regional	LC		26 000	3400
	Testudinidae	*Chersina angulata*	Endemic	Endemic	Global	LC		450 000	223 000
	Testudinidae	*Chersobius boulengeri*	Endemic	Endemic	Global	EN	A4ace	144 000	115 000
	Testudinidae	*Chersobius signatus*	Endemic	Endemic	Global	EN	A4ace	93 000	56 000
	Testudinidae	*Homopus areolatus*	Endemic	Endemic	Global	LC		233 000	88 500
	Testudinidae	*Homopus femoralis*	Endemic	Endemic	Global	LC		307 000	188 000
	Testudinidae	*Kinixys lobatsiana*	Near-endemic	Near-endemic	Global	VU	A4cde	112 750	81 600
	Testudinidae	*Kinixys natalensis*	Near-endemic	Near-endemic	Global	VU	A4c	105 000	56 150
	Testudinidae	*Kinixys spekii*	Not endemic	Not endemic	Regional	LC		240 000	187 000
	Testudinidae	*Kinixys zombensis*	Not endemic	Not endemic	Regional	LC		19 700	18 200
	Testudinidae	*Psammobates geometricus*	Endemic	Endemic	Global	CR	A4ace	2 750	399
	Testudinidae	*Psammobates oculifer*	Not endemic	Not endemic	Regional	LC		540 000	266 000
	Testudinidae	*Psammobates tentorius*	Endemic	Endemic	Global	NT	A4ce	626 300	480 500

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Testudines (continued)									
	Testudinidae	*Stigmochelys pardalis*	Not endemic	Not endemic	Regional	LC		1 500 000	840 000
Squamata (Lizards)									
	Agamidae	*Acanthocercus atricollis*	Not endemic	Not endemic	Regional	LC		424 000	281 000
	Agamidae	*Agama aculeata*	Not endemic	Not endemic	Regional	LC		1 336 000	962 000
	Agamidae	*Agama anchietae*	Not endemic	Not endemic	Regional	LC		244 000	128 000
	Agamidae	*Agama armata*	Not endemic	Not endemic	Regional	LC		24 900	22 100
	Agamidae	*Agama atra*	Near-endemic	Near-endemic	Global	LC		1 677 000	1 221 000
	Agamidae	*Agama hispida*	Near-endemic	Near-endemic	Global	LC		177 300	112 800
	Amphisbaenidae	*Chirindia langi*	Endemic	Endemic	Global	LC		7 540	3 610
	Amphisbaenidae	*Dalophia pistillum*	Not endemic	Not endemic	Regional	LC		191 000	157 000
	Amphisbaenidae	*Monopeltis capensis*	Near-endemic	Near-endemic	Global	LC		231 300	203 150
	Amphisbaenidae	*Monopeltis decosteri*	Not endemic	Not endemic	Regional	LC		2 720	716
	Amphisbaenidae	*Monopeltis infuscata*	Not endemic	Not endemic	Regional	LC		670 000	412 000
	Amphisbaenidae	*Monopeltis leonhardi*	Not endemic	Not endemic	Regional	LC		354 000	109 000
	Amphisbaenidae	*Monopeltis mauricei*	Not endemic	Not endemic	Regional	LC		108 000	67 400
	Amphisbaenidae	*Monopeltis sphenorhynchus*	Not endemic	Not endemic	Regional	LC		445 000	14 000
	Amphisbaenidae	*Zygaspis arenicola*	Not endemic	Not endemic	Regional	LC		16 400	8 550
	Amphisbaenidae	*Zygaspis quadrifrons*	Not endemic	Not endemic	Regional	LC		525 000	276 000
	Amphisbaenidae	*Zygaspis vandami*	Endemic	Endemic	Global	LC		48 800	11 600
	Chamaeleonidae	*Bradypodion atromontanum*	Endemic	Endemic	Global	LC		2 650	1 510
	Chamaeleonidae	*Bradypodion barbatulum*	Endemic	Endemic	Global	LC		2 340	1 400
	Chamaeleonidae	*Bradypodion baviaanense*	Endemic	Endemic	Global	LC		570	340
	Chamaeleonidae	*Bradypodion caeruleogula*	Endemic	Endemic	Global	EN	B1ab(i,ii,iii) + 2ab(i,ii,iii)	230	44.5

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Chamaeleonidae	*Bradypodion caffrum*	Endemic	Endemic	Global	EN	B1 ab(i-i,iii,iv) + B2ab(ii,iii,iv)	422	120
	Chamaeleonidae	*Bradypodion damaranum*	Endemic	Endemic	Global	LC		7 330	3 110
	Chamaeleonidae	*Bradypodion dracomontanum*	Endemic	Endemic	Global	NT	B1b(iii)	12 210	5 340
	Chamaeleonidae	*Bradypodion gutturale*	Endemic	Endemic	Global	LC		69 000	47 600
	Chamaeleonidae	*Bradypodion kentanicum*	Endemic	Endemic	Global	VU	B1b(i,ii,iii,iv)	3 050	2 710
	Chamaeleonidae	*Bradypodion melanocephalum*	Endemic	Endemic	Global	NT	B1b(iii)	15 490	8 690
	Chamaeleonidae	*Bradypodion nemorale*	Endemic	Endemic	Global	VU	D2	648	58
	Chamaeleonidae	*Bradypodion ngomeense*	Endemic	Endemic	Global	VU	D2	51	33
	Chamaeleonidae	*Bradypodion occidentale*	Endemic	Endemic	Global	LC		55 000	29 200
	Chamaeleonidae	*Bradypodion pumilum*	Endemic	Endemic	Global	NT	B1b(iii)	9 870	6 520
	Chamaeleonidae	*Bradypodion setaroi*	Near-endemic	Near-endemic	Global	NT	B1b(I,iii)	6 800	5 100
	Chamaeleonidae	*Bradypodion taeniabronchum*	Endemic	Endemic	Global	LC		3 250	521
	Chamaeleonidae	*Bradypodion thamnobates*	Endemic	Endemic	Global	EN	B1ab(i,ii,iii,v)	4 610	4 170
	Chamaeleonidae	*Bradypodion transvaalense*	Near-endemic	Endemic	Global	LC		77 000	16 500
	Chamaeleonidae	*Bradypodion ventrale*	Endemic	Endemic	Global	LC		217 000	155 000
	Chamaeleonidae	*Bradypodion venustum*	Endemic	Endemic	Global	VU	D2	5.8	4.3
	Chamaeleonidae	*Chamaeleo dilepis*	Not endemic	Not endemic	Regional	LC		755 000	464 000
	Chamaeleonidae	*Chamaeleo namaquensis*	Not endemic	Not endemic	Regional	LC		213 000	140 000
	Cordylidae	*Chamaesaura aenea*	Near-endemic	Endemic	Global	NT	A3c	292 000	98 900
	Cordylidae	*Chamaesaura anguina*	Not endemic	Not endemic	Regional	LC		918 000	198 000
	Cordylidae	*Chamaesaura macrolepis*	Near-endemic	Near-endemic	Global	LC		199 150	58 100

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Cordylidae	*Cordylus cordylus*	Endemic	Endemic	Global	LC		382 000	209 000
	Cordylidae	*Cordylus imkeae*	Endemic	Endemic	Global	LC		1 030	1 030
	Cordylidae	*Cordylus jonesii*	Not endemic	Not endemic	Regional	LC		269 000	162 000
	Cordylidae	*Cordylus macropholis*	Endemic	Endemic	Global	NT	B1b(iii)	21 940	2 720
	Cordylidae	*Cordylus mclachlani*	Endemic	Endemic	Global	LC		9 350	7 780
	Cordylidae	*Cordylus minor*	Endemic	Endemic	Global	LC		49 570	18 885
	Cordylidae	*Cordylus niger*	Endemic	Endemic	Global	LC		2 480	456
	Cordylidae	*Cordylus oelofseni*	Endemic	Endemic	Global	LC		8 950	2 810
	Cordylidae	*Cordylus vittifer*	Near-endemic	Near-endemic	Global	LC		350 000	264 000
	Cordylidae	*Hemicordylus capensis*	Endemic	Endemic	Global	LC		91 000	18 200
	Cordylidae	*Hemicordylus nebulosus*	Endemic	Endemic	Global	VU	D1	13	12
	Cordylidae	*Karusasaurus polyzonus*	Near-endemic	Near-endemic	Global	LC		843 200	646 600
	Cordylidae	*Namazonurus lawrenci*	Endemic	Endemic	Global	LC		7 860	6 520
	Cordylidae	*Namazonurus peersi*	Endemic	Endemic	Global	LC		14 960	10 600
	Cordylidae	*Ninurta coeruleopunctatus*	Endemic	Endemic	Global	LC		7 460	4 300
	Cordylidae	*Ouroborus cataphractus*	Endemic	Endemic	Global	NT	A4d	85 000	62 000
	Cordylidae	*Platysaurus attenboroughi*	Not endemic	Not endemic	Regional	LC		20 340	13 000
	Cordylidae	*Platysaurus broadleyi*	Endemic	Endemic	Global	LC		4 820	1 580
	Cordylidae	*Platysaurus capensis*	Endemic	Endemic	Global	LC		4 780	4 670
	Cordylidae	*Platysaurus guttatus*	Endemic	Endemic	Global	LC		17 630	8 870
	Cordylidae	*Platysaurus intermedius*	Not endemic	Not endemic	Regional	LC		156 000	113 000
	Cordylidae	*Platysaurus lebomboensis*	Near-endemic	Near-endemic	Global	LC		8 340	8 220
	Cordylidae	*Platysaurus minor*	Endemic	Endemic	Global	LC		23 300	19 200
	Cordylidae	*Platysaurus monotropis*	Endemic	Endemic	Global	NT	B1b(iii)	433	355
	Cordylidae	*Platysaurus orientalis*	Endemic	Endemic	Global	LC		16 200	16 200

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Cordylidae	*Platysaurus relictus*	Endemic	Endemic	Global	NT	A3c	2 330	2 140
	Cordylidae	*Pseudocordylus langi*	Endemic	Endemic	Global	LC		2 040	1 880
	Cordylidae	*Pseudocordylus melanotus*	Near-endemic	Endemic	Global	LC		298 000	164 000
	Cordylidae	*Pseudocordylus microlepidotus*	Endemic	Endemic	Global	LC		292 000	159 000
	Cordylidae	*Pseudocordylus spinosus*	Endemic	Endemic	Global	LC		4 500	3 215
	Cordylidae	*Pseudocordylus transvaalensis*	Endemic	Endemic	Global	LC		17 280	4 300
	Cordylidae	*Smaug barbertonensis*	Endemic	Endemic	Global	LC		3 060	2 940
	Cordylidae	*Smaug breyeri*	Endemic	Endemic	Global	LC		17 990	11 900
	Cordylidae	*Smaug depressus*	Endemic	Endemic	Global	LC		17 000	11 200
	Cordylidae	*Smaug giganteus*	Endemic	Endemic	Global	VU	A2bcd+ 4bcd	40 600	22 000
	Cordylidae	*Smaug swazicus*	Near-endemic	Endemic	Global	LC		12 900	12 800
	Cordylidae	*Smaug vandami*	Endemic	Endemic	Global	LC		83 000	29 400
	Cordylidae	*Smaug warreni*	Near-endemic	Near-endemic	Global	LC		7 840	5 040
	Gekkonidae	*Afroedura amatolica*	Endemic	Endemic	Global	LC		6 000	4 100
	Gekkonidae	*Afroedura broadleyi*	Endemic	Endemic	Global	LC		3 700	2 500
	Gekkonidae	*Afroedura granitica*	Endemic	Endemic	Global	LC		58	51
	Gekkonidae	*Afroedura haackei*	Endemic	Endemic	Global	LC		2 000	1 850
	Gekkonidae	*Afroedura halli*	Near-endemic	Endemic	Global	LC		41 000	15 000
	Gekkonidae	*Afroedura hawequensis*	Endemic	Endemic	Global	LC		1 400	1 000
	Gekkonidae	*Afroedura karroica*	Endemic	Endemic	Global	LC		26 500	24 000
	Gekkonidae	*Afroedura langi*	Endemic	Endemic	Global	LC		3 600	3 400
	Gekkonidae	*Afroedura leoloensis*	Endemic	Endemic	Global	LC		2 400	1 800
	Gekkonidae	*Afroedura major*	Not present	Eswatini Endemic	Global	LC		1 600	1 500

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Gekkonidae	*Afroedura maripi*	Endemic	Endemic	Global	LC		293	69
	Gekkonidae	*Afroedura marleyi*	Near-endemic	Near-endemic	Global	LC		21 500	16 350
	Gekkonidae	*Afroedura multiporis*	Endemic	Endemic	Global	NT	B1b(i,iii)	650	218
	Gekkonidae	*Afroedura namaquensis*	Endemic	Endemic	Global	LC		2 250	960
	Gekkonidae	*Afroedura nivaria*	Endemic	Endemic	Global	LC		13 600	5 000
	Gekkonidae	*Afroedura pienaari*	Endemic	Endemic	Global	LC		7 740	6 300
	Gekkonidae	*Afroedura pondolia*	Endemic	Endemic	Global	LC		53 000	30 200
	Gekkonidae	*Afroedura pongola*	Endemic	Endemic	Global	DD		1 370	1 370
	Gekkonidae	*Afroedura rondavelica*	Endemic	Endemic	Global	DD		701	701
	Gekkonidae	*Afroedura rupestris*	Endemic	Endemic	Global	LC		400	228
	Gekkonidae	*Afroedura tembulica*	Endemic	Endemic	Global	LC		1 730	1 710
	Gekkonidae	*Afroedura transvaalica*	Not endemic	Not endemic	Regional	LC		4 390	2 780
	Gekkonidae	*Afroedura waterbergensis*	Endemic	Endemic	Global	LC		188	180
	Gekkonidae	*Afrogecko porphyreus*	Endemic	Endemic	Global	LC		290 000	59 600
	Gekkonidae	*Chondrodactylus angulifer*	Not endemic	Not endemic	Regional	LC		439 000	317 000
	Gekkonidae	*Chondrodactylus bibronii*	Not endemic	Not endemic	Regional	LC		726 000	594 000
	Gekkonidae	*Chondrodactylus laevigatus*	Not endemic	Not endemic	Regional	LC		146 000	61 000
	Gekkonidae	*Chondrodactylus turneri*	Not endemic	Not endemic	Regional	LC		300 000	200 000
	Gekkonidae	*Cryptactites peringueyi*	Endemic	Endemic	Global	LC		1 510	138
	Gekkonidae	*Goggia braacki*	Endemic	Endemic	Global	LC		2 140	1450
	Gekkonidae	*Goggia essexi*	Endemic	Endemic	Global	LC		24 600	8 050
	Gekkonidae	*Goggia gemmula*	Near-endemic	Near-endemic	Global	LC		3 100	2 600
	Gekkonidae	*Goggia hewitti*	Endemic	Endemic	Global	LC		25 000	18 800
	Gekkonidae	*Goggia hexapora*	Endemic	Endemic	Global	LC		22 200	18 100
	Gekkonidae	*Goggia incognita*	Endemic	Endemic	Global	LC		78 000	52 900

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Gekkonidae	*Goggia lineata*	Near-endemic	Near-endemic	Global	LC		56 000	46 000
	Gekkonidae	*Goggia matzikamaensis*	Endemic	Endemic	Global	LC		835	834
	Gekkonidae	*Goggia microlepidota*	Endemic	Endemic	Global	LC		11 120	8 890
	Gekkonidae	*Goggia rupicola*	Endemic	Endemic	Global	LC		4 050	3 770
	Gekkonidae	*Hemidactylus mabouia*	Not endemic	Not endemic	Regional	LC		1 237 000	296 000
	Gekkonidae	*Homopholis arnoldi*	Not endemic	Not endemic	Regional	LC		98 000	45 700
	Gekkonidae	*Homopholis mulleri*	Endemic	Endemic	Global	NT	A3c	7 780	4 750
	Gekkonidae	*Homopholis wahlbergii*	Near-endemic	Near-endemic	Global	LC		294 300	203 300
	Gekkonidae	*Lygodactylus bradfieldi*	Not endemic	Not endemic	Regional	LC		546 000	197 000
	Gekkonidae	*Lygodactylus capensis*	Not endemic	Not endemic	Regional	LC		633 000	364 000
	Gekkonidae	*Lygodactylus graniticolus*	Endemic	Endemic	Global	LC		903	820
	Gekkonidae	*Lygodactylus incognitus*	Endemic	Endemic	Global	LC		871	780
	Gekkonidae	*Lygodactylus methueni*	Endemic	Endemic	Global	EN	B1ab(i,ii,i-i,iv,v)	2 100	1 280
	Gekkonidae	*Lygodactylus montiscaeruli*	Endemic	Endemic	Global	LC		755	448
	Gekkonidae	*Lygodactylus nigropunctatus*	Endemic	Endemic	Global	LC		59 000	21 500
	Gekkonidae	*Lygodactylus ocellatus*	Near-endemic	Endemic	Global	LC		87 000	62 300
	Gekkonidae	*Lygodactylus soutpansbergensis*	Endemic	Endemic	Global	LC		3 220	2 850
	Gekkonidae	*Lygodactylus stevensoni*	Not endemic	Not endemic	Regional	LC		31 400	6 320
	Gekkonidae	*Lygodactylus waterbergensis*	Endemic	Endemic	Global	LC		3 570	3 040
	Gekkonidae	*Pachydactylus affinis*	Endemic	Endemic	Global	LC		144 000	127 000
	Gekkonidae	*Pachydactylus amoenus*	Endemic	Endemic	Global	LC		8 450	7 910
	Gekkonidae	*Pachydactylus atorquatus*	Near-endemic	Endemic	Global	LC		36 500	25 900
	Gekkonidae	*Pachydactylus austeni*	Endemic	Endemic	Global	LC		56 000	24 100

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Gekkonidae	*Pachydactylus barnardi*	Near-endemic	Near-endemic	Global	LC		3 1360	27 300
	Gekkonidae	*Pachydactylus capensis*	Not endemic	Not endemic	Regional	LC		1 095 000	868 000
	Gekkonidae	*Pachydactylus carinatus*	Not endemic	Not endemic	Regional	LC		6 530	4 920
	Gekkonidae	*Pachydactylus formosus*	Endemic	Endemic	Global	LC		47 300	38 700
	Gekkonidae	*Pachydactylus geitje*	Endemic	Endemic	Global	LC		208 000	103 000
	Gekkonidae	*Pachydactylus haackei*	Not endemic	Not endemic	Regional	LC		22 700	6 560
	Gekkonidae	*Pachydactylus kladaroderma*	Endemic	Endemic	Global	LC		48 100	30 500
	Gekkonidae	*Pachydactylus labialis*	Endemic	Endemic	Global	LC		65 000	40 100
	Gekkonidae	*Pachydactylus latirostris*	Not endemic	Not endemic	Regional	LC		224 000	183 000
	Gekkonidae	*Pachydactylus macrolepis*	Endemic	Endemic	Global	LC		41 900	31 300
	Gekkonidae	*Pachydactylus maculatus*	Near-endemic	Near-endemic	Global	LC		522 000	314 000
	Gekkonidae	*Pachydactylus mariquensis*	Endemic	Endemic	Global	LC		468 000	405 000
	Gekkonidae	*Pachydactylus monicae*	Not endemic	Not endemic	Regional	LC		1 450	1 160
	Gekkonidae	*Pachydactylus montanus*	Not endemic	Not endemic	Regional	LC		44 600	21 900
	Gekkonidae	*Pachydactylus namaquensis*	Near-endemic	Near-endemic	Global	LC		26 450	21 400
	Gekkonidae	*Pachydactylus oculatus*	Endemic	Endemic	Global	LC		201 000	133 000
	Gekkonidae	*Pachydactylus punctatus*	Not endemic	Not endemic	Regional	LC		617 000	128 000
	Gekkonidae	*Pachydactylus purcelli*	Near-endemic	Near-endemic	Global	LC		274 900	217 700
	Gekkonidae	*Pachydactylus rangei*	Not endemic	Not endemic	Regional	LC		3 250	2 600
	Gekkonidae	*Pachydactylus rugosus*	Not endemic	Not endemic	Regional	LC		278 000	188 000
	Gekkonidae	*Pachydactylus tigrinus*	Not endemic	Not endemic	Regional	LC		15 630	13 100
	Gekkonidae	*Pachydactylus vansoni*	Not endemic	Not endemic	Regional	LC		252 000	151 000
	Gekkonidae	*Pachydactylus visseri*	Not endemic	Not endemic	Regional	LC		1 560	993
	Gekkonidae	*Pachydactylus wahlbergii*	Not endemic	Not endemic	Regional	LC		322 000	67 600
	Gekkonidae	*Pachydactylus weberi*	Near-endemic	Endemic	Global	LC		89 400	82 000

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Gekkonidae	*Ptenopus garrulus*	Not endemic	Not endemic	Regional	LC		1 009 000	398 000
	Gekkonidae	*Ramigekko swartbergensis*	Endemic	Endemic	Global	LC		1 620	815
	Gekkonidae	*Rhoptropella ocellata*	Near-endemic	Near-endemic	Global	LC		24 500	18 800
	Gerrhosauridae	*Broadleysaurus major*	Not endemic	Not endemic	Regional	LC		88 000	65 100
	Gerrhosauridae	*Cordylosaurus subtessellatus*	Not endemic	Not endemic	Regional	LC		249 000	90 300
	Gerrhosauridae	*Gerrhosaurus auritus*	Peripheral	Peripheral	Global	LC		6 220	5 760
	Gerrhosauridae	*Gerrhosaurus flavigularis*	Not endemic	Not endemic	Regional	LC		1 192 000	601 000
	Gerrhosauridae	*Gerrhosaurus intermedius*	Not endemic	Not endemic	Regional	LC		74 000	46 500
	Gerrhosauridae	*Gerrhosaurus typicus*	Endemic	Endemic	Global	LC		339 000	124 000
	Gerrhosauridae	*Matobosaurus validus*	Not endemic	Not endemic	Regional	LC		209 000	152 000
	Gerrhosauridae	*Tetradactylus africanus*	Near-endemic	Near-endemic	Global	LC		88 100	64 800
	Gerrhosauridae	*Tetradactylus breyeri*	Endemic	Endemic	Global	NT	C2a(i)	65 000	13 100
	Gerrhosauridae	*Tetradactylus eastwoodae*	Endemic	Endemic	Global	EX		705	705
	Gerrhosauridae	*Tetradactylus fitzsimonsi*	Endemic	Endemic	Global	LC		52 140	5 850
	Gerrhosauridae	*Tetradactylus seps*	Endemic	Endemic	Global	LC		404 000	75 200
	Gerrhosauridae	*Tetradactylus tetradactylus*	Endemic	Endemic	Global	LC		271 000	109 000
	Lacertidae	*Australolacerta australis*	Endemic	Endemic	Global	LC		8 680	6 480
	Lacertidae	*Heliobolus lugubris*	Not endemic	Not endemic	Regional	LC		612 000	246 000
	Lacertidae	*Ichnotropis capensis*	Not endemic	Not endemic	Regional	LC		151 000	59 700
	Lacertidae	*Meroles ctenodactylus*	Not endemic	Not endemic	Regional	LC		26 500	22 100
	Lacertidae	*Meroles cuneirostris*	Not endemic	Not endemic	Regional	LC		2 440	2 210
	Lacertidae	*Meroles knoxii*	Near-endemic	Near-endemic	Global	LC		173 300	98 400
	Lacertidae	*Meroles squamulosus*	Not endemic	Not endemic	Regional	LC		578 000	340 000
	Lacertidae	*Meroles suborbitalis*	Not endemic	Not endemic	Regional	LC		420 000	318 000
	Lacertidae	*Nucras aurantiaca*	Endemic	Endemic	Global	DD		1 160	1 120

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Lacertidae	*Nucras caesicaudata*	Peripheral	Peripheral	Global	DD		230	223
	Lacertidae	*Nucras holubi*	Not endemic	Not endemic	Regional	LC		586 000	361 000
	Lacertidae	*Nucras intertexta*	Not endemic	Not endemic	Regional	LC		670 000	349 000
	Lacertidae	*Nucras lalandii*	Near-endemic	Endemic	Global	LC		659 000	258 000
	Lacertidae	*Nucras livida*	Endemic	Endemic	Global	LC		190 000	113 000
	Lacertidae	*Nucras ornata*	Not endemic	Not endemic	Regional	LC		260 000	92 000
	Lacertidae	*Nucras taeniolata*	Endemic	Endemic	Global	LC		11 500	8 750
	Lacertidae	*Nucras tessellata*	Not endemic	Not endemic	Regional	LC		420 000	266 000
	Lacertidae	*Pedioplanis burchelli*	Near-endemic	Endemic	Global	LC		526 000	345 000
	Lacertidae	*Pedioplanis inornata*	Not endemic	Not endemic	Regional	LC		191 000	89 200
	Lacertidae	*Pedioplanis laticeps*	Near-endemic	Near-endemic	Global	LC		288 300	250 750
	Lacertidae	*Pedioplanis lineoocellata*	Not endemic	Not endemic	Regional	LC		1 280 000	965 000
	Lacertidae	*Pedioplanis namaquensis*	Not endemic	Not endemic	Regional	LC		646 000	527 000
	Lacertidae	*Tropidosaura cottrelli*	Near-endemic	Endemic	Global	LC		16 470	4 510
	Lacertidae	*Tropidosaura essexi*	Near-endemic	Endemic	Global	LC		24 000	10 100
	Lacertidae	*Tropidosaura gularis*	Endemic	Endemic	Global	LC		49 800	41 500
	Lacertidae	*Tropidosaura montana*	Endemic	Endemic	Global	LC		380 000	83 800
	Lacertidae	*Vhembelacerta rupicola*	Endemic	Endemic	Global	LC		1 870	1 630
	Scincidae	*Acontias albigularis*	Endemic	Endemic	Global	DD		698	698
	Scincidae	*Acontias breviceps*	Endemic	Endemic	Global	LC		63 000	16 900
	Scincidae	*Acontias cregoi*	Endemic	Endemic	Global	LC		25 700	18 800
	Scincidae	*Acontias fitzsimonsi*	Endemic	Endemic	Global	LC		1 750	1 730
	Scincidae	*Acontias gariepensis*	Not endemic	Not endemic	Regional	LC		23 700	19 500
	Scincidae	*Acontias gracilicauda*	Near-endemic	Endemic	Global	LC		405 000	306 000
	Scincidae	*Acontias grayi*	Endemic	Endemic	Global	NT	B1b(iii)	5 040	3 100

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Scincidae	*Acontias kgalagadi*	Not endemic	Not endemic	Regional	LC		316 000	65 300
	Scincidae	*Acontias lineatus*	Not endemic	Not endemic	Regional	LC		250 000	101 000
	Scincidae	*Acontias lineicauda*	Endemic	Endemic	Global	LC		6 290	4 470
	Scincidae	*Acontias litoralis*	Endemic	Endemic	Global	LC		16 350	10 700
	Scincidae	*Acontias meleagris*	Endemic	Endemic	Global	LC		65 000	48 100
	Scincidae	*Acontias namaquensis*	Endemic	Endemic	Global	LC		28 500	17 400
	Scincidae	*Acontias occidentalis*	Not endemic	Not endemic	Regional	LC		324 000	179 000
	Scincidae	*Acontias orientalis*	Endemic	Endemic	Global	LC		142 000	126 000
	Scincidae	*Acontias parietalis*	Near-endemic	Near-endemic	Global	LC		7 500	6 600
	Scincidae	*Acontias plumbeus*	Not endemic	Not endemic	Regional	LC		412 000	157 000
	Scincidae	*Acontias richardi*	Endemic	Endemic	Global	NT	B1b(iii)	680	660
	Scincidae	*Acontias rieppeli*	Endemic	Endemic	Global	EN	B1ab(i,ii,i-i,iv)	870	600
	Scincidae	*Acontias tristis*	Endemic	Endemic	Global	LC		60 000	32 300
	Scincidae	*Acontias wakkerstroomensis*	Endemic	Endemic	Global	DD		4 460	2 750
	Scincidae	*Cryptoblepharus africanus*	Not endemic	Not endemic	Regional	CR	D	4	0.01
	Scincidae	*Mochlus sundevallii*	Not endemic	Not endemic	Regional	LC		461 000	224 000
	Scincidae	*Panaspis maculicollis*	Not endemic	Not endemic	Regional	LC		113 000	73 800
	Scincidae	*Panaspis wahlbergii*	Not endemic	Not endemic	Regional	LC		614 000	397 900
	Scincidae	*Scelotes anguinus*	Endemic	Endemic	Global	LC		9 460	4 970
	Scincidae	*Scelotes arenicola*	Not endemic	Not endemic	Regional	LC		2 880	2 590
	Scincidae	*Scelotes bidigittatus*	Near-endemic	Near-endemic	Global	LC		84 500	52 350
	Scincidae	*Scelotes bipes*	Endemic	Endemic	Global	LC		36 700	6 270
	Scincidae	*Scelotes bourquini*	Endemic	Endemic	Global	VU	B1ab(i,iii,v)	5 470	5 100
	Scincidae	*Scelotes caffer*	Endemic	Endemic	Global	LC		234 000	118 000

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Scincidae	*Scelotes capensis*	Not endemic	Not endemic	Regional	LC		7 860	5 810
	Scincidae	*Scelotes fitzsimonsi*	Endemic	Endemic	Global	LC		1 550	1 060
	Scincidae	*Scelotes gronovii*	Endemic	Endemic	Global	NT	B1b(i,ii,iii)	7 810	3 010
	Scincidae	*Scelotes guentheri*	Endemic	Endemic	Global	EX		118	83
	Scincidae	*Scelotes inornatus*	Endemic	Endemic	Global	CR	B1ab(i,ii,i-ii,iv,v)	99	5
	Scincidae	*Scelotes kasneri*	Endemic	Endemic	Global	EN	B1ab(ii,iii,iv)	4 480	2 710
	Scincidae	*Scelotes limpopoensis*	Not endemic	Not endemic	Regional	LC		39 600	27 400
	Scincidae	*Scelotes mirus*	Near-endemic	Endemic	Global	LC		69 000	56 700
	Scincidae	*Scelotes montispectus*	Endemic	Endemic	Global	NT	B1b(iii)	3 150	1 460
	Scincidae	*Scelotes mossambicus*	Not endemic	Not endemic	Regional	LC		116 000	68 500
	Scincidae	*Scelotes sexlineatus*	Near-endemic	Near-endemic	Global	LC		54 800	16 000
	Scincidae	*Scelotes vestigifer*	Near-endemic	Near-endemic	Global	LC		4 100	2 400
	Scincidae	*Trachylepis capensis*	Not endemic	Not endemic	Regional	LC		1 404 000	1 022 000
	Scincidae	*Trachylepis damarana*	Not endemic	Not endemic	Regional	LC		194 000	166 000
	Scincidae	*Trachylepis depressa*	Not endemic	Not endemic	Regional	LC		130 000	13 100
	Scincidae	*Trachylepis homalocephala*	Near-endemic	Endemic	Global	LC		1 030 000	227 000
	Scincidae	*Trachylepis laevigata*	Endemic	Endemic	Global	LC		131 000	88 700
	Scincidae	*Trachylepis margaritifer*	Not endemic	Not endemic	Regional	LC		226 000	169 000
	Scincidae	*Trachylepis occidentalis*	Not endemic	Not endemic	Regional	LC		559 000	384 000
	Scincidae	*Trachylepis punctatissima*	Not endemic	Not endemic	Regional	LC		624 000	547 000
	Scincidae	*Trachylepis punctulata*	Not endemic	Not endemic	Regional	LC		609 000	201 000
	Scincidae	*Trachylepis sparsa*	Not endemic	Not endemic	Regional	LC		110 000	93 000
	Scincidae	*Trachylepis spilogaster*	Not endemic	Not endemic	Regional	LC		318 000	151 000
	Scincidae	*Trachylepis striata*	Not endemic	Not endemic	Regional	LC		331 000	163 000

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Lizards) (continued)									
	Scincidae	*Trachylepis sulcata*	Not endemic	Not endemic	Regional	LC		582 000	490 000
	Scincidae	*Trachylepis varia*	Not endemic	Not endemic	Regional	LC		775 000	627 000
	Scincidae	*Trachylepis variegata*	Not endemic	Not endemic	Regional	LC		633 000	513 000
	Scincidae	*Typhlosaurus caecus*	Endemic	Endemic	Global	LC		19 100	8 380
	Scincidae	*Typhlosaurus lomiae*	Endemic	Endemic	Global	NT	B1b(iii)	504	356
	Scincidae	*Typhlosaurus meyeri*	Not endemic	Not endemic	Regional	LC		1 330	1 070
	Scincidae	*Typhlosaurus vermis*	Near-endemic	Near-endemic	Global	LC		17 750	10 100
	Varanidae	*Varanus albigularis*	Not endemic	Not endemic	Regional	LC		1 247 000	713 000
	Varanidae	*Varanus niloticus*	Not endemic	Not endemic	Regional	LC		1 258 000	576 000
Squamata (Snakes)									
	Atractaspididae	*Amblyodipsas concolor*	Near-endemic	Endemic	Global	LC		198 000	53 100
	Atractaspididae	*Amblyodipsas microphthalma*	Not endemic	Not endemic	Regional	LC		123 000	11 100
	Atractaspididae	*Amblyodipsas polylepis*	Not endemic	Not endemic	Regional	LC		271 000	151 000
	Atractaspididae	*Amblyodipsas ventrimaculata*	Not endemic	Not endemic	Regional	LC		73 000	18 200
	Atractaspididae	*Aparallactus capensis*	Not endemic	Not endemic	Regional	LC		765 000	523 000
	Atractaspididae	*Aparallactus lunulatus*	Not endemic	Not endemic	Regional	LC		58 000	40 300
	Atractaspididae	*Atractaspis bibronii*	Not endemic	Not endemic	Regional	LC		912 000	488 000
	Atractaspididae	*Atractaspis duerdeni*	Not endemic	Not endemic	Regional	LC		118 000	22 400
	Atractaspididae	*Homoroselaps dorsalis*	Near-endemic	Endemic	Global	NT	A2c	190 000 –320 000	42 800
	Atractaspididae	*Homoroselaps lacteus*	Near-endemic	Endemic	Global	LC		1 207 000	347 000
	Atractaspididae	*Macrelaps microlepidotus*	Endemic	Endemic	Global	LC		108 000	50 100
	Atractaspididae	*Xenocalamus bicolor*	Not endemic	Not endemic	Regional	LC		779 000	254 000
	Atractaspididae	*Xenocalamus transvaalensis*	Not endemic	Not endemic	Regional	LC		95 000	13 400
	Colubridae	*Crotaphopeltis hotamboeia*	Not endemic	Not endemic	Regional	LC		1 310 000	850 000

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Snakes) (continued)									
	Colubridae	*Dasypeltis inornata*	Near-endemic	Endemic	Global	LC		354 000	99 900
	Colubridae	*Dasypeltis medici*	Not endemic	Not endemic	Regional	LC		8 640	5 020
	Colubridae	*Dasypeltis scabra*	Not endemic	Not endemic	Regional	LC		1 440 000	1 199 000
	Colubridae	*Dipsadoboa aulica*	Not endemic	Not endemic	Regional	LC		82 000	47 200
	Colubridae	*Dispholidus typus*	Not endemic	Not endemic	Regional	LC		1 262 000	621 000
	Colubridae	*Meizodon semiornatus*	Not endemic	Not endemic	Regional	LC		51 000	21 000
	Colubridae	*Philothamnus angolensis*	Not endemic	Not endemic	Regional	NT	A2c+ B1b(i,iii,iv,v)	12 750	10 750
	Colubridae	*Philothamnus hoplogaster*	Not endemic	Not endemic	Regional	LC		710 000	257 000
	Colubridae	*Philothamnus natalensis*	Not endemic	Not endemic	Regional	LC		134 000	29 600
	Colubridae	*Philothamnus occidentalis*	Near-endemic	Endemic	Global	LC		751 000	313 000
	Colubridae	*Philothamnus semivariegatus*	Not endemic	Not endemic	Regional	LC		1 135 000	379 000
	Colubridae	*Telescopus beetzi*	Not endemic	Not endemic	Regional	LC		314 000	256 000
	Colubridae	*Telescopus semiannulatus*	Not endemic	Not endemic	Regional	LC		783 000	354 000
	Colubridae	*Thelotornis capensis*	Not endemic	Not endemic	Regional	LC		389 000	212 000
	Elapidae	*Aspidelaps lubricus*	Not endemic	Not endemic	Regional	LC		487 000	384 000
	Elapidae	*Aspidelaps scutatus*	Not endemic	Not endemic	Regional	LC		579 000	194 000
	Elapidae	*Dendroaspis angusticeps*	Not endemic	Not endemic	Regional	VU	B2ab(ii,iii,i-v,v)	21 490	520
	Elapidae	*Dendroaspis polylepis*	Not endemic	Not endemic	Regional	LC		827 000	270 000
	Elapidae	*Elapsoidea boulengeri*	Not endemic	Not endemic	Regional	LC		235 000	85 000
	Elapidae	*Elapsoidea sundevallii*	Not endemic	Not endemic	Regional	LC		846 000	318 000
	Elapidae	*Hemachatus haemachatus*	Near-endemic	Near-endemic	Global	LC		969 000	381 500
	Elapidae	*Hydrophis platurus*	Peripheral	Peripheral	Global	LC			
	Elapidae	*Naja annulifera*	Not endemic	Not endemic	Regional	LC		392 000	210 000

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Snakes) (continued)									
	Elapidae	*Naja mossambica*	Not endemic	Not endemic	Regional	LC		383 000	264 000
	Elapidae	*Naja nigricincta*	Not endemic	Not endemic	Regional	LC		303 000	63 800
	Elapidae	*Naja nivea*	Not endemic	Not endemic	Regional	LC		943 000	732 000
	Elapidae	*Naja subfulva*	Not endemic	Not endemic	Regional	LC		99 000	9 740
	Lamprophiidae	*Boaedon capensis*	Not endemic	Not endemic	Regional	LC		1 560 000	1 200 000
	Lamprophiidae	*Boaedon mentalis*	Not endemic	Not endemic	Regional	LC		215 000	167 000
	Lamprophiidae	*Gracililima nyassae*	Not endemic	Not endemic	Regional	LC		291 000	150 000
	Lamprophiidae	*Inyoka swazicus*	Near-endemic	Endemic	Global	LC		40 400	8 190
	Lamprophiidae	*Lamprophis aurora*	Near-endemic	Endemic	Global	LC		827 000	497 000
	Lamprophiidae	*Lamprophis fiskii*	Endemic	Endemic	Global	LC		171 000	62 000
	Lamprophiidae	*Lamprophis fuscus*	Near-endemic	Endemic	Global	LC		613 000	71 700
	Lamprophiidae	*Lamprophis guttatus*	Near-endemic	Near-endemic	Global	LC		1 460 000	565 000
	Lamprophiidae	*Limaformosa capensis*	Not endemic	Not endemic	Regional	LC		373 000	186 000
	Lamprophiidae	*Lycodonomorphus inornatus*	Near-endemic	Endemic	Global	LC		909 000	186 000
	Lamprophiidae	*Lycodonomorphus laevissimus*	Near-endemic	Endemic	Global	LC		416 000	147 000
	Lamprophiidae	*Lycodonomorphus obscuriventris*	Not endemic	Not endemic	Regional	LC		39 400	16 000
	Lamprophiidae	*Lycodonomorphus rufulus*	Not endemic	Not endemic	Regional	LC		1 009 000	510 000
	Lamprophiidae	*Lycophidion capense*	Not endemic	Not endemic	Regional	LC		1 218 000	754 000
	Lamprophiidae	*Lycophidion pygmaeum*	Near-endemic	Near-endemic	Global	NT	B1b(iii)	14 250	12 520
	Lamprophiidae	*Lycophidion variegatum*	Not endemic	Not endemic	Regional	LC		125 000	80 800
	Lamprophiidae	*Montaspis gilvomaculata*	Endemic	Endemic	Global	DD		3 690	2 700
	Leptotyphlopidae	*Leptotyphlops conjunctus*	Near-endemic	Endemic	Global	LC		402 000	184 000
	Leptotyphlopidae	*Leptotyphlops distanti*	Near-endemic	Near-endemic	Global	LC		146 500	82 600
	Leptotyphlopidae	*Leptotyphlops incognitus*	Not endemic	Not endemic	Regional	LC		249 000	176 000

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Snakes) (continued)									
	Leptotyphlopidae	*Leptotyphlops jacobseni*	Endemic	Endemic	Global	LC		22 600	10 800
	Leptotyphlopidae	*Leptotyphlops nigricans*	Endemic	Endemic	Global	LC		195 000	118 000
	Leptotyphlopidae	*Leptotyphlops scutifrons*	Not endemic	Not endemic	Regional	LC		819 000	500 000
	Leptotyphlopidae	*Leptotyphlops sylvicolus*	Endemic	Endemic	Global	LC		93 000	22 200
	Leptotyphlopidae	*Leptotyphlops telloi*	Not present	Near-endemic	Global	NT	B1b(iii)	1 270	1 080
	Leptotyphlopidae	*Myriopholis longicauda*	Not endemic	Not endemic	Regional	LC		116 000	91 400
	Leptotyphlopidae	*Namibiana gracilior*	Not endemic	Not endemic	Regional	LC		48 900	32 800
	Leptotyphlopidae	*Namibiana occidentalis*	Not endemic	Not endemic	Regional	LC		29 100	7 010
	Natricidae	*Natriciteres sylvatica*	Not endemic	Not endemic	Regional	LC		3 020	1 420
	Prosymnidae	*Prosymna bivittata*	Not endemic	Not endemic	Regional	LC		747 000	325 000
	Prosymnidae	*Prosymna frontalis*	Not endemic	Not endemic	Regional	LC		138 000	67 500
	Prosymnidae	*Prosymna janii*	Not endemic	Not endemic	Regional	LC		2 250	1 480
	Prosymnidae	*Prosymna lineata*	Not endemic	Not endemic	Regional	LC		138 000	88 500
	Prosymnidae	*Prosymna stuhlmanni*	Not endemic	Not endemic	Regional	LC		137 000	93 900
	Prosymnidae	*Prosymna sundevallii*	Near-endemic	Near-endemic	Global	LC		1 140 000	579 500
	Psammophiidae	*Dipsina multimaculata*	Not endemic	Not endemic	Regional	LC		574 000	295 000
	Psammophiidae	*Hemirhagerrhis nototaenia*	Not endemic	Not endemic	Regional	LC		185 000	62 000
	Psammophiidae	*Psammophis angolensis*	Not endemic	Not endemic	Regional	LC		190 000	129 000
	Psammophiidae	*Psammophis brevirostris*	Not endemic	Not endemic	Regional	LC		668 000	369 000
	Psammophiidae	*Psammophis crucifer*	Near-endemic	Near-endemic	Global	LC		154 500	526 300
	Psammophiidae	*Psammophis jallae*	Not endemic	Not endemic	Regional	NT	C2a(i)	60 000	40 400
	Psammophiidae	*Psammophis leightoni*	Not endemic	Not endemic	Regional	LC		102 6000	444 000
	Psammophiidae	*Psammophis mossambicus*	Not endemic	Not endemic	Regional	LC		190 000	111 000
	Psammophiidae	*Psammophis notostictus*	Not endemic	Not endemic	Regional	LC		788 000	609 000
	Psammophiidae	*Psammophis subtaeniatus*	Not endemic	Not endemic	Regional	LC		272 000	194 000

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Snakes) (continued)									
	Psammophiidae	*Psammophis trigrammus*	Not endemic	Not endemic	Regional	LC		1 360	1 330
	Psammophiidae	*Psammophylax rhombeatus*	Near-endemic	Near-endemic	Global	LC		1 315 000	564 000
	Psammophiidae	*Psammophylax tritaeniatus*	Not endemic	Not endemic	Regional	LC		419 000	345 000
	Psammophiidae	*Rhamphiophis rostratus*	Not endemic	Not endemic	Regional	LC		62 000	37 100
	Psammophiidae	*Pseudaspis cana*	Not endemic	Not endemic	Regional	LC		1 533 000	1 016 000
	Pseudoxyrhophiidae	*Amplorhinus multimaculatus*	Near-endemic	Near-endemic	Global	LC		941 400	126 400
	Pseudoxyrhophiidae	*Duberria lutrix*	Not endemic	Not endemic	Regional	LC		994 000	549 000
	Pseudoxyrhophiidae	*Duberria variegata*	Not endemic	Not endemic	Regional	LC		10 700	8 420
	Pythonidae	*Python natalensis*	Not endemic	Not endemic	Regional	LC		773 000	345 000
	Typhlopidae	*Afrotyphlops bibronii*	Not endemic	Not endemic	Regional	LC		665 000	398 000
	Typhlopidae	*Afrotyphlops fornasinii*	Not endemic	Not endemic	Regional	LC		20 180	15 300
	Typhlopidae	*Afrotyphlops mucruso*	Not endemic	Not endemic	Regional	LC		33 000	15 000
	Typhlopidae	*Afrotyphlops schlegelii*	Not endemic	Not endemic	Regional	LC		218 290	133 170
	Typhlopidae	*Indotyphlops braminus*	Introduced	Introduced	Global	LC			
	Typhlopidae	*Rhinotyphlops lalandei*	Not endemic	Not endemic	Regional	LC		1 517 000	1 048 000
	Typhlopidae	*Rhinotyphlops schinzi*	Not endemic	Not endemic	Regional	LC		288 000	169 000
	Viperidae	*Bitis albanica*	Endemic	Endemic	Global	EN	B1ab(i,iii,i-v,v)	699	581
	Viperidae	*Bitis arietans*	Not endemic	Not endemic	Regional	LC		1 560 000	1 244 000
	Viperidae	*Bitis armata*	Endemic	Endemic	Global	VU	B1ab(i,iii,i-v,v)	17 770	2 140
	Viperidae	*Bitis atropos*	Endemic	Near-endemic	Global	LC		1 088 100	140 450
	Viperidae	*Bitis caudalis*	Not endemic	Not endemic	Regional	LC		1 042 000	489 000
	Viperidae	*Bitis cornuta*	Not endemic	Not endemic	Regional	LC		60 000	46 700
	Viperidae	*Bitis gabonica*	Not endemic	Not endemic	Regional	NT	B1b(i,iii,v)+ B2b(ii,iii,v)	3 660	1 900

Group	Family	Species	South African status	Regional status	Type	Category	Criteria	EOO	Distribution
Squamata (Snakes) (continued)									
	Viperidae	*Bitis inornata*	Endemic	Endemic	Global	LC		5 900	
	Viperidae	*Bitis rubida*	Endemic	Endemic	Global	LC		61 000	27 000
	Viperidae	*Bitis schneideri*	Not endemic	Not endemic	Regional	LC		11 590	5 350
	Viperidae	*Bitis xeropaga*	Not endemic	Not endemic	Regional	LC		31 400	9 710
	Viperidae	*Causus defilippii*	Not endemic	Not endemic	Regional	LC		262 000	125 000
	Viperidae	*Causus rhombeatus*	Not endemic	Not endemic	Regional	LC		870 000	356 000

Ouroborus cataphractus (© N. Maury).

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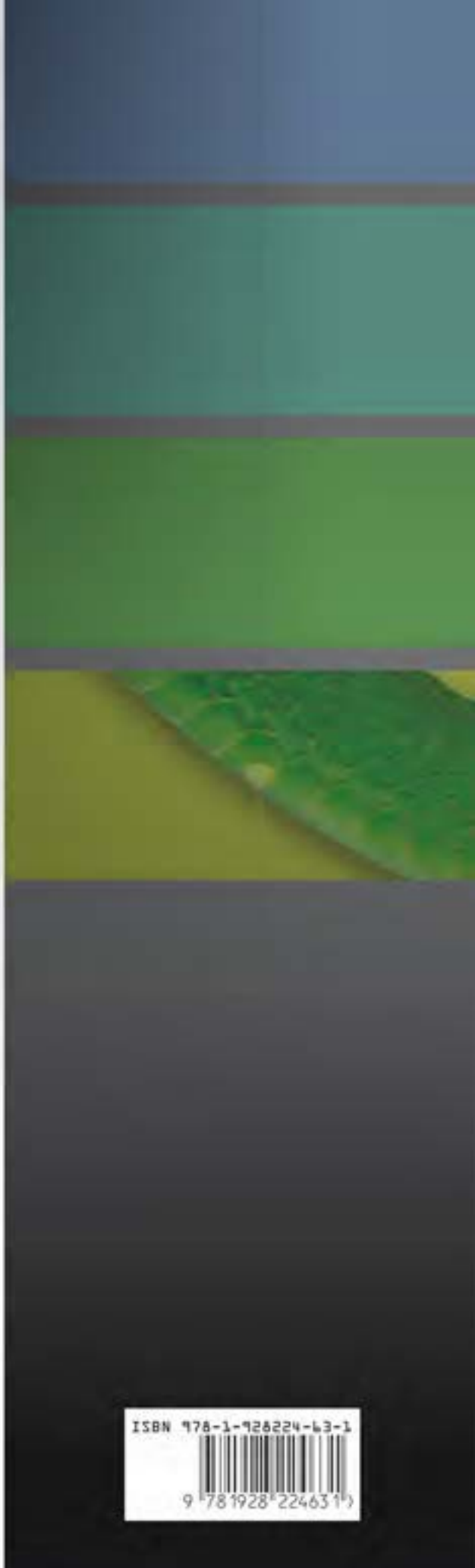
This publication details the IUCN Red List assessments for all 401 described reptile species (Crocodilia, Testudines and Squamata) that occur in South Africa, Eswatini and Lesotho, excluding marine and introduced species. As of 2022, these Red List assessments were brought up to date using the most current information. Existing range maps were modified using new data and interpreted distributions of where species most likely occur were created using expert knowledge. Each species account provides an extinction risk assessment, a description of the range and the active threats, as well as recommendations for conservation. In addition, new photographs of each species have been included.

Approximately 13% (54 species) of the reptile fauna are of conservation concern, either falling into a threat category (Extinct [0.5%], Critically Endangered [1%], Endangered [2.4%], Vulnerable [4.1%]), or by being classified as Near Threatened (5.6%), or Data Deficient (1.7%). Habitat loss and degradation of habitat are overall the most serious threats to the long-term survival of reptiles in the region. For some species, climate change is considered an imminent threat.

The introductory chapters detail the history of Red Listing in the region and review the assessment process and threat types. Spatial information has been recently updated and includes species richness and endemism maps, as well as geographical information on where habitat loss is most severe.

This volume also serves as an atlas, designed to be used by researchers, conservation practitioners and the general public. It can be used as a reference handbook, but also as a field guide for both professionals and laypersons when reviewing the distributions of reptiles. The many new photographs should be helpful for species identifications. Important components are the assessment of extinction risk for each species and the conservation recommendations, as the ever-expanding human footprint must be balanced with responsible land-use planning that takes species extinction risk into account.



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