Biodiversity Data Journal 6: e26203
doi: 10.3897/BDJ.6.e26203

Species Conservation Profiles

Species conservation profiles of a random sample of world spiders II: Gnaphosidae to Nemesiidae

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Academic editor: Pavel Stoev

Received: 26 Apr 2018 | Accepted: 26 Jun 2018 | Published: 29 Jun 2018

Citation: Seppälä S, Henriques S, Draney M, Foord S, Gibbons A, Gomez L, Kariko S, Malumbres-Olarte J, Milne M, Vink C, Cardoso P (2018) Species conservation profiles of a random sample of world spiders II: Gnaphosidae to Nemesiidae. Biodiversity Data Journal 6: e26203. https://doi.org/10.3897/BDJ.6.e26203

ZooBank: urn:lsid:zoobank.org:pub:284927A1-ED23-4E40-B9A6-6270B38B7193

Abstract

Background

The IUCN Red List of Threatened Species is the most widely used information source on the extinction risk of species. One of the uses of the Red List is to evaluate and monitor the state of biodiversity and a possible approach for this purpose is the Red List Index (RLI). For many taxa, mainly hyperdiverse groups, it is not possible within available resources to assess all known species. In such cases, a random sample of species might be selected for assessment and the results derived from it extrapolated for the entire group - the

Sampled Red List Index (SRLI). The current contribution is the second in four papers that will constitute the baseline of a future spider SRLI encompassing 200 species distributed across the world.

New information

A sample of 200 species of spiders were randomly selected from the World Spider Catalogue, an updated global database containing all recognised species names for the group. The 200 selected species where divided taxonomically at the family level and the familes were ordered alphabetically. In this publication, we present the conservation profiles of 45 species belonging to the families alphabetically arranged between Gnaphosidae and Nemesiidae, which encompassed Gnaphosidae, Idiopidae, Linyphiidae, Liocranidae, Lycosidae, Micropholcommatidae, Mysmenidae and Nemesiidae.

Keywords

Araneae, Arthropoda, conservation, endangered species, extinction risk, geographical range, IUCN.

Introduction

The IUCN Red List of Threatened Species is the most widely used information source on the extinction risk of species (Lamoreux et al. 2003, Rodrigues et al. 2006, Mace et al. 2008, see also Cardoso et al. 2011, Cardoso et al. 2012). It is based on a number of objective criteria, which are relatively easy to apply when adequate information is available (IUCN 2001). The Red List has been used to raise awareness about threatened species, guide conservation efforts and funding, set priorities for protection, measure site irreplaceability and vulnerability and influence environmental policies and legislation (Gardenfors et al. 2001, Rodrigues et al. 2006, Mace et al. 2008, Martín-López et al. 2009).

One of the uses of the Red List is to evaluate and monitor the state of biodiversity and a possible approach for this purpose is the Red List Index (RLI). The RLI helps to develop a better understanding of which taxa, regions or ecosystems are declining or improving their conservation status. It provides policy-makers, stakeholders, conservation practitioners and the general public with sound knowledge of biodiversity status and change and tools with which to make informed decisions. The RLI uses weight scores based on the Red List status of each of the assessed species. These scores range from 0 (Least Concern) to 5 (Extinct/Extinct in the Wild). Summing these scores across all species, relating them to the worst-case scenario - all species extinct and comparing two or more points in time, gives us an indication of how biodiversity is doing. At a global level, the RLI has been calculated for birds (Butchart et al. 2004, Hoffmann et al. 2010), mammals (Hoffmann et al. 2011),

amphibians (Hoffmann et al. 2010), corals (Butchart et al. 2010) and cycads (United Nations 2015).

For many taxa, mainly hyperdiverse groups, it is not possible within available resources to assess all known species. In such cases, a random sample of species might be selected for assessment and the results derived from it extrapolated for the entire group - the Sampled Red List Index (SRLI, Baillie et al. 2008). The SRLI is now being developed for plants (Brummitt et al. 2015) and efforts towards a SRLI of butterflies (Lewis and Senior 2010) and Odonata are also in progress (Clausnitzer et al. 2009).

Spiders currently comprise over 47000 species described at a global level (World Spider Catalog 2017). Of these, only 199 species (0.4%) have beed assessed (www.redlist.org), of which the vast majority are from the Seychelles Islands or belong to the golden-orb weavers, Nephilidae (e.g. Kuntner et al. 2017). To these, a large number will be added in the near future, such as 55 species endemic to the Madeira and Selvagens archipelagos and 25 endemic to the Azores, all in Portugal (Cardoso et al. 2017, Borges et al. submitted). The vast majority of spiders assessed to date are therefore either regionally or taxonomically clustered and do not represent the group as a whole. The current contribution is the second in four papers (Seppälä et al. 2018) that will constitute the baseline of a future spider SRLI encompassing 200 species distributed across the world.

Methods

A sample of 200 species of spiders were randomly selected from the World Spider Catalogue (2018), an updated global database containing all recognised species names for the group. The 200 selected species where divided taxonomically to the family level, and those familes were ordered alphabetically. In this publication, we present the conservation profiles of 45 species belonging to the families alphabetically arranged between Gnaphosidae and Nemesiidae, which encompassed Gnaphosidae, Idiopidae, Linyphiidae, Liocranidae, Lycosidae, Micropholcommatidae, Mysmenidae and Nemesiidae.

Species data were collected from all taxonomic bibliography available at the World Spider Catalogue (2018), complemented by data in other publications found through Google Scholar and georeferrenced points made available through the Global Biodiversity Information Facility (www.gbif.org) and also other sources (https://www.biodiversitylibrary.org; https://login.webofknowledge.com; http://srs.britishspiders.org.uk; http://symbiota4.acis.ufl.edu/scan/portal; https://lepus.unine.ch; http://www.tuite.nl/iwg/Araneae/SpiBenelux/?species; https://atlas.arages.de; https://arachnology.cz/rad/araneae-1.html; http://www.ennor.org/iberia/). Whenever possible, with each species record, we also collected additional information, namely habitat type and spatial error of coordinates.

For all analyses, we used the R package red - IUCN red-listing tools (Cardoso 2017). This package performs a number of spatial analyses based on either observed occurrences or estimated ranges. Functions include calculating Extent of Occurrence (EOO), Area of Occupancy (AOO), mapping species ranges, species distribution modelling using climate

and land cover, calculating the Red List Index for groups of species, amongst others. In this work, the EOO and AOO were calculated in one of two ways:

- for extremely range-restricted species for which we assumed knowledge of the full range, these values were classified as observed, the minimum convex polygon encompassing all observations used to calculate the EOO and the 2 km x 2 km cells known to be occupied used to calculate the AOO. When the EOO was smaller than the AOO, it was made equal as per the IUCN guidelines (IUCN Standards and Petitions Subcommittee 2017).

- for widespread species or those for which we did not have confidence to know the full range, we performed species distribution modelling (SDM). This was done based on both climatic (Fick and Hijmans 2017) and landcover (Tuanmu and Jetz 2014) datasets, at an approximately 1x1 km resolution. Before modelling, the world layers were cropped to the region of interest for each species and reduced to four layers through a PCA to avoid overfitting. In addition, latitude and longitude were used as two extra layers to avoid the models predicting presences much beyond the known region following the precautionary principle. We then used the Maxent method (Phillips et al. 2006) implemented in the R package red. Isolated patches outside the original distribution polygon were excluded from maps to avoid overestimation of EOO and AOO values. All final maps and values were checked and validated by our own expert opinion. KMLs derived from these maps were also produced using the red package. The cells (2x2 km), predicted to be occupied, were used to calculate the AOO. When the EOO was smaller than the AOO, it was made equal as per the IUCN guidelines (IUCN Standards and Petitions Subcommittee 2017).

To infer possible changes in range and/or abundance and for forest species only, we have also consulted the Global Forest Watch portal (World Resources Institute 2014), looking for changes in forest cover during the last 10 years that could have affected the species.

Species Conservation Profiles

Berlandina kolosvaryi Caporiacco, 1947

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Taxonomic notes

Species description was based on a single juvenile specimen (Caporiacco 1947), the taxonomic status being therefore doubtful.

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Afrotropical

Countries:

- Tanzania, United Republic of

Map of records (Google Earth):

Suppl. material 1

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

The unspecified type locality is in 'East Africa' which may refer to Tanzania (Caporiacco 1947).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Tanzania is covered with tropical and subtropical forest, grasslands, savannahs and shrublands (Olson et al. 2001). Otherwise, the preferred habitat of this species is unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 6.2 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Species of *Berlandina* are usually caught with pitfall traps and found under rocks or amongst leaf litter (Platnick and Shadab 1982). Gnaphosids do not build webs but hunt actively. This family preys on a variety of ground-dweller arthropods, such as ants, other spiders and termites (Dippenaar-Schoeman and Jocqué 1997). Size of this species is based on a single known juvenile specimen (Caporiacco 1947).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.1. Research - Taxonomy
- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Species description was based on a single juvenile specimen (Caporiacco 1947), so the taxonomic status is doubtful. If a valid species, basic research is needed to know current distribution and population size and trends, ecology and traits of the species along with possible threats.

Drassyllus excavatus (Schenkel, 1963)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arhtropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- China

Map of records (Google Earth):

Suppl. material 2

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species has been recorded from Beijing and Kansu in China (Schenkel 1963, Song 1994). The true range is however unknown.

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

The localities in Beijing belong to the ecoregion of temperate broadleaf and mixed forests and Gansu is mostly covered with desert and xeric shrublands (Olson et al. 2001) which indicates this species may be able to adapt to various habitats from forests to deserts.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 5.56-9.56 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Species of *Drassyllus* are usually caught with pitfall traps and found under rocks or amongst leaf litter (Platnick and Shadab 1982). Gnaphosids do not build webs but hunt actively. This family preys on a variety of ground-dwelling arthropods, such as ants, other spiders and termites (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to know the current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Gnaphosa kankhalae Biswas & Roy, 2008

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- India

Map of records (Google Earth):

Suppl. material 3

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species is known only from the type locality in Rishikesh, Northern India, recorded in 2003 (Biswas and Roy 2008).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Rishikesh, the type locality, is situated in the Himalayas and is covered by farmlands near the river and streams from the mountains. The region is located in the border of montane grasslands and the tropical and subtropical moist broadleaf forest ecoregion (Olson et al. 2001). Yet, the specific preferred habitat of this species remains unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 10.5 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Gnaphosids do not build webs but hunt actively. This family preys on a variety of ground-dwelling arthropods, such as ants, other spiders and termites (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats.

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to know the current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Gnaphosa tenebrosa Fox, 1938

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Neotropical

Countries:

- Mexico

Map of records (Google Earth):

Suppl. material 4

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

In the species description, the type locality is stated to be in Labrador, which is in Canada (Fox 1938). This locality is almost certainly incorrect considering this species is closely related with *Gnaphosa sonora*. Later authors assumed its true provenance is Mexico, probably Labrados in Sinaloa, however there is a possibility it has been totally mislabelled (Platnick and Shadab 1975).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

Population size and trend are unknown.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Since the type locality is uncertain (Platnick and Shadab 1975), habitat preferences of this species cannot be inferred. However, if the record was indeed misread as Labrador but was made in Labrados, the habitat in the region is tropical and subtropical coniferous forests with patches of tropical and subtropical dry broadleaf forests (Olson et al. 2001).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 6.8 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Gnaphosids do not build webs but hunt actively. This family preys on a

variety of ground-dwelling arthropods, such as ants, other spiders and termites (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to know current distribution and population size and trends, ecology and traits of the species along with possible threats.

Leptodrassus croaticus Dalmas, 1919

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Taxonomic notes

It is not clear if this is indeed a valid species. The differences with *L. albidus* need tobe described in more detail (Robert Bosmans, pers. comm.).

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Croatia

Map of records (Google Earth):

Suppl. material 5

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species is known only from the type locality in Crikvenica (Grikvenica), Croatia (Dalmas 1919).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

Population size and trend are unknown.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Crikvenica is located on the coast of the Adriatic sea and is mainly forested area, belonging to the ecoregion of Mediterranean forests, woodlands and scrub, although today the coastline is heavily urbanised (Olson et al. 2001). The preferred habitat remains unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: Unknown

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Species of the same genus are usually caught with pitfall traps and found under rocks or amongst leaf litter (Platnick and Shadab 1982). Gnaphosids do not build webs but hunt actively. This family preys on a variety of ground-dwelling arthropods such as ants, other spiders and termites (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.1. Research - Taxonomy
- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

According to Robert Bosmans (pers. comm.), this species needs to be redescribed and the differences with *L. albidus* should be described in more detail. If a valid species, basic research is needed to know current distribution and population size and trends, ecology and traits of the species along with possible threats.

Orodrassus coloradensis (Emerton, 1877)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- Canada
- United States

Map of records (Google Earth):

Suppl. material 6

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Platnick and Shadab 1975, GBIF.org 2018e), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 433

Max Elevation/Depth (m): 4150

Range description

This species is very widely distributed in western North America (Platnick and Shadab 1975, GBIF.org 2018e).

Extent of occurrence

EOO (km2): 2130519

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable, this being a very widespread species living across multiple habitat types.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 1181716

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable, this being a very widespread species living across multiple habitat types.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

No known threats to the species.
Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist. Population sizes are probably very high with more than 100 distribution records and a taxonomic revision that confirms a wide distribution range (Platnick and Shadab 1975).

Subpopulations

Trend: Stable

Justification for trend

No known threats to the species.

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

Occurs in a wide range of habitats, namely in aspen, spruce, fir, lodgepole, pine and jack-pine forests (Platnick and Shadab 1975, GBIF.org 2018e). The range of this species stretches across temperate coniferous forest and temperate xeric shrublands (Olson et al. 2001).

Trend in extent, area or quality?: Stable

Justification for trend

This species does not seemto have any specific habitat requirements.

Habitat importance: Major Importance

Habitats:

- 1.4. Forest - Temperate
- 3.4. Shrubland - Temperate

Ecology

Size: 8.03-8.96 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Adult females of this species have been reported from March to November and adult males from May to late September. The species has been recorded at altitudes as high as 4150 m (Platnick and Shadab 1975).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

There are numerous protected areas inside the range of this species (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends.

Scotophaeus nigrosegmentatus (Simon, 1895)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Pakistan
- China

Map of records (Google Earth):

Suppl. material 7

Basis of EOO and AOO: Unknown

Basis (narrative)

Despite a relatively high number of records (Simon 1895, Caporiacco 1934), these are old and the species distribution models were not found to be reasonable. Hence, only observed records are presented and AOO and EOO are considered unknown.

Min Elevation/Depth (m): 3155

Max Elevation/Depth (m): 5772

Range description

Distribution of this species is stated originally as Mongolia (Blackwall 1867, World Spider Catalog 2017), but Koschoty-Daban, north of the mountain chain of Tian Shan (originally as Tjan-Schan) is in China and further records are from Pakistan (Simon 1895, Caporiacco 1934).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Justification for number of locations

Given that this species has only been recorded at high altitudes near glaciers, despite sampling in other lower altitude areas (Caporiacco 1934), the ongoing climate change can be a serious threat, through ecosystem shifts or habitat loss. In addition, river flow and freshwater sources will change in volume and timing (Xu et al. 2009). Yet, it is impossible to determine the number of locations without knowing the true distribution.

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

All specimens have been found at high altitudes in meadows alongside a glacier and a damp grassy valley, always amongst rocks or low grasses (Caporiacco 1934).

Trend in extent, area or quality?: Decline (inferred)

Justification for trend

Given the current levels of global warming, the putative habitat of this mountain species is probably decreasing in area and quality.

Habitat importance: Major Importance

Habitats:

- 4.4. Grassland - Temperate
- 6. Rocky areas (e.g. inland cliffs, mountain peaks)

Ecology

Size: 9 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Species of the same genus are usually caught with pitfall traps and found under rocks or amongst leaf litter (Platnick and Shadab 1982). Gnaphosids do not build webs but catch or roll up their prey with silk. This family prey on a variety of ground-dwellers like insects, ants, other spiders and termites (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Ongoing

Threats:

- 11.1. Climate change & severe weather - Habitat shifting & alteration

Justification for threats

Since this species has been recorded at high altitudes near glaciers, there is a possibility that the ongoing climate change is a threat to its survival.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Conservation action type: Needed

Conservation actions:

- 4.3. Education & awareness - Awareness & communications

Justification for conservation actions

Although part of this species range is inside protected areas (UNEP-WCMC and IUCN 2017), no effective protection can be provided against possible habitat loss due to rising temperatures. Awareness and communication should be taken into consideration due to the possible severe effect on habitats due to climate change.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research to determine the distribution range, population size and their trends is essential. Knowledge on the species ecology and traits, namely its dependence on disappearing resources due to climate change, would be equally important.

Urozelotes mysticus Platnick & Murphy, 1984

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Italy

Map of records (Google Earth):

Suppl. material 8

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

Originally recorded from an unspecified type locality (Platnick and Murphy 1984), it is known from mainland Sicily and Lachea Island, on its eastern coast (Padovani 2010). Given the scarcity of records, it is impossible to know the true EOO or AOO.

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

The preferred habitat is unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 4.03 - 5.10 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Gnaphosids do not build webs but hunt actively. This family preys on a variety of ground-dwelling arthropods, including ants, other spiders and termites (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to know the current distribution and population size and trends, ecology and traits of the species along with possible threats.

Zelotes anthereus Chamberlin, 1936

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- United States

Map of records (Google Earth):

Suppl. material 9

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Chamberlin 1936, Platnick and Shadab 1983), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 1356

Range description

This species is largely restricted to central California, USA, from Fresno north to Chico (Chamberlin 1936, Platnick and Shadab 1983).

Extent of occurrence

EOO (km2): 80752

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): 51488

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Justification for number of locations

The main geographic area (as defined by Platnick and Shadab 1983), occupied by this species, also includes major urban areas of human habitation that are currently increasing in their spread. This urbanification of the landscape also includes the spread of agriculture in central California and the construction of roads and highways throughout the area. Yet, we have no data to estimate whether or not these affect the species or how many locations there could be.

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

The only habitat data available mention the species has been found under rocks, logs and bark in forested areas, however, these forested areas include camp-grounds, parks, canyons, tree farms and orchards (Platnick and Shadab 1983).

Trend in extent, area or quality?: Unknown

Justification for trend

Although the area, in which this species is found, has had documented logging (Global Forest Watch 2014), the extent of this logging is minimal. Much of the area in which this species resides is also heavily developed (e.g. Sacramento, San Francisco, Modesto, San Jose etc). It is unknown however if the expansion of these urban areas is increasing the extinction risk for the spider.

Habitat importance: Major Importance

Habitats:

- 1.4. Forest - Temperate

Ecology

Size: 4.75 - 7.67 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Gnaphosids do not build webs but actively hunt for their prey. This family preys on a variety of ground-dwelling arthropods, including ants, termites and other spiders (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Ongoing

Threats:

- 1.1. Residential & commercial development - Housing & urban areas
- 2.1. Agriculture & aquaculture - Annual & perennial non-timber crops
- 2.3. Agriculture & aquaculture - Livestock farming & ranching
- 4.1. Transportation & service corridors - Roads & railroads

Justification for threats

The main geographic area (as defined by Platnick and Shadab 1983), occupied by this species, also includes major urban areas of human habitation that are currently increasing in their spread. This urbanisation of the landscape also includes the spread of agriculture in central California and the construction of roads and highways throughout the area. These possible threats are only suspected and cannot be confirmed with existing data.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection

Justification for conservation actions

Some of the habitat for this species likely includes eastern Californian forests that are under federal or state protection.

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

It is unknown how large is the current population of *Z. anthereus* or how accurate our range estimate is (Suppl. material 9). Nor is it known if the range or population is changing in size or what might impact it. Basic information is needed on the reproductive biology, habitat and ecology of this species so that we may assess its main threats and extinction risk.

Zelotes ashae Tikader & Gajbe, 1976

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- India

Map of records (Google Earth):

Suppl. material 10

Basis of EOO and AOO: Unknown

Basis (narrative)

Only three records of this species are known (Tikader and Gajbe 1976, Gajbe 2003), therefore species distribution models could not be produced with confidence. Only observed records are presented.

Min Elevation/Depth (m): 259

Max Elevation/Depth (m): 571

Range description

This species is known from India, recorded in the 1970s (Tikader and Gajbe 1976, Gajbe 2003).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

The western part of India is covered with tropical and subtropical dry broadleaf forests and deserts and shrublands (Olson et al. 2001). Otherwise, the preferred habitat for this species is unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 8.2 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Species of the same genus are usually caught with pitfall traps and found under rocks or amongst leaf litter (Platnick and Shadab 1982). This family preys on a variety of ground-dwelling arthropods, including ants, termites and other spiders (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Z. ashae is known from only three sites in India. Basic research is needed on its true distribution, ecology, traits and possible threats across its range.

Zelotes mulanjensis FitzPatrick, 2007

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Gnaphosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Afrotropical

Countries:

- Malawi

Map of records (Google Earth):

Suppl. material 11

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records, all from 1981 (FitzPatrick 2007), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 1928

Max Elevation/Depth (m): 2834

Range description

Zelotes mulanjensis is only known from the Mulanje Massif in Malawi (FitzPatrick 2007).

Extent of occurrence

EOO (km2): 232

Trend: Decline (inferred)

Justification for trend

Possible decline of the species habitat due to ongoing deforestation with expansion of agriculture within its small range.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: Yes

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): 232

Trend: Decline (inferred)

Justification for trend

Possible decline of the species habitat due to ongoing deforestation with expansion of agriculture within its small range.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: Yes

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Justification for number of locations

There is ongoing deforestation with expansion of agricultural areas in the Mulanje Mountain Forest Reserve (Global Forest Watch 2014) - 209 ha of tree cover have already been lost between 2004-2016. It is however impossible to estimate the number of locations with current data.

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Decline (inferred)

Justification for trend

Decline due to possible loss of AOO.

Basis for decline:

- (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: Yes

Extreme fluctuations?: Unknown

Subpopulations

Trend: Stable

Justification for trend

We assume the entire area of the species constitutes a single subpopulation.

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

This species has been found from grassland with rocky outcrops and low shrubs (FitzPatrick 2007). We do not know however if it also occurs in other habitat types.

Trend in extent, area or quality?: Decline (estimated)

Justification for trend

Deforestation and agriculture expansion are leading to the loss of habitat area and quality across the range.

Habitat importance: Major Importance

Habitats:

- 3.7. Shrubland - Subtropical/Tropical High Altitude

Ecology

Size: 5.42 - 6.79 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

The ecology and traits of this species are unknown. Gnaphosids are free-living, ground-dwelling spiders which usually store their egg sacs on the ground (Dippenaar-Schoeman and Jocqué 1997). Species of the same genus are usually caught with pitfall traps and found under rocks or amongst leaf litter (Platnick and Shadab 1982). This family preys on a variety of ground-dwelling arthropods, including ants, termites and other spiders (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Ongoing

Threats:

- 2. Agriculture & aquaculture
- 5.3. Biological resource use - Logging & wood harvesting

Justification for threats

There is ongoing deforestation in the Mulanje Mountain Forest Reserve, with conversion to agricultural fields (Global Forest Watch 2014). However, as the species is found in grasslands, the extent of increase in extinction risk is unknown.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection

Conservation action type: Needed

Conservation actions:

- 1.2. Land/water protection - Resource & habitat protection
- 2.3. Land/water management - Habitat & natural process restoration
- 5.2. Law & policy - Policies and regulations
- 5.4. Law & policy - Compliance and enforcement
- 4.3. Education & awareness - Awareness & communications

Justification for conservation actions

Although the entire species range is probably legally protected, effective protection is needed with future recovery of lost habitat. Enforcement of new policies and regulations would guarantee such effectiveness. In addition, education of local people towards the importance of natural resources would facilitate the habitat and species recovery.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring of the changes in this species population due to deforestation and land use change is a priority.

Cantuaria wanganuiensis (Todd, 1945)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Idiopidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Australasian

Countries:

- New Zealand

Map of records (Google Earth):

Suppl. material 12

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species has been reported from Whanganui in New Zealand, last recorded in 1962 (Todd 1945, Forster 1968).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist. Population densities of *Cantuaria* can be relatively high; up to 592 burrows in 20 square metres have been found. The reduced number of specimens in the description (Todd 1945) and the lack of sightings in the last half century (Forster 1968) might indicate that *C. wanganuiensis* occurs in low densities.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

A single specimen was found in bushes in unknown habitat (Todd 1945). Whanganui is a city located in the North Island of New Zealand on the coast of South Taranaki Bay and was originally covered with temperate broadleaf and mixed forests (Olson et al. 2001).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 15.5 mm

Generation length (yr): 2

Dependency of single sp?: No

Ecology and traits (narrative)

The spiders of the genus *Cantuaria* are large trapdoor spiders that build burrows with trapdoors and are likely to hunt by leaping out of the burrow but never totally leaving it for catching the prey (Marples and Marples 1972). However, the single *C. wanganuiensis* specimen was found in an open burrow without a trapdoor and is rather small (Todd 1945). The burrows of this genus are usually found in areas where the soil is not too rocky and there is not much vegetation but different species may have different microhabitat preferences (Marples and Marples 1972). Spiders of the same genus appear to feed on earthworms and also parts of beetles have been found from the bottom of their burrows. *Cantuaria* species usually lay about 30 eggs kept in a cocoon and the young may stay in a burrow for quite a long time, the female specimens rarely being seen as they stay in their burrows while males leave the burrows to look for a mate (Marples and Marples 1972).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation action type: Needed

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to know current distribution and population size and trends of the species along with possible threats.

Cataxia bolganupensis (Main, 1985)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Idiopidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Australasian

Countries:

- Australia

Map of records (Google Earth):

Suppl. material 13

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Main 1985, GBIF.org 2018d, Rix et al. 2017a), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 157

Max Elevation/Depth (m): 574

Range description

This species has a highly restricted distribution and is found only from the Porongurup National Park. It is often locally abundant, although only known from the Millinup Pass and Bolganup Creek areas (Rix et al. 2017a).

Extent of occurrence

EOO (km2): 56

Trend: Decline (inferred)

Justification for trend

Climate change driving the continuing decline of habitat quality, as are past and possible future wildfires in the region (Rix et al. 2017a).

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Area of occupancy

AOO (km2): 56

Trend: Decline (inferred)

Justification for trend

Climate change driving the continuing decline of habitat quality, as are past and possible future wildfires in the region (Rix et al. 2017a).

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Locations

Number of locations: 1

Justification for number of locations

Climate change is causing continuing decline of habitat quality across the entire range of the species, but past and possible future wildfires in the region are the main concern (Rix et al. 2017a). Forest fires may cause a plausible threat to this species' survival since it has been reported to be endemic to the wet karri forests (Rix et al. 2017a). A single future fire may affect the two known subpopulations.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Decline (inferred)

Justification for trend

Inferred from decline in habitat quality.

Basis for decline:

- (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Number of subpopulations: 2

Trend: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Yes

Habitat (narrative)

This species is endemic to the tall, wet karri (*Eucalyptus diversicolor*) forests of the Porongurup Range (Rix et al. 2017a).

Trend in extent, area or quality?: Decline (estimated)

Justification for trend

There is a decline in the quality of habitat in the Porongurup National Park due to climate change (Rix et al. 2017a).

Habitat importance: Major Importance

Habitats:

- 1.6. Forest - Subtropical/Tropical Moist Lowland

Ecology

Size: 7.3-7.8 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

C. bolganupensis builds an open-holed burrow, ornamented with a radiating skirt of leaves and twigs around the entrance (Rix et al. 2017a). Males probably wander and mate in late autumn or winter.

Threats

Threat type: Past

Threats:

- 7.1. Natural system modifications - Fire & fire suppression
- 11.1. Climate change & severe weather - Habitat shifting & alteration

Threat type: Future

Threats:

- 7.1. Natural system modifications - Fire & fire suppression

- 11.1. Climate change & severe weather - Habitat shifting & alteration

Justification for threats

Climate change is causing continuing decline of habitat quality across the entire range of the species, but past and possible future wildfires in the region are the main concern (Rix et al. 2017a).

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Conservation action type: Needed

Conservation actions:

- 2.3. Land/water management - Habitat & natural process restoration
- 4.3. Education & awareness - Awareness & communications

Justification for conservation actions

At least part of the range of this species is inside protected areas, namely Porongurup National Park (Main 1985,GBIF.org 2018d, Rix et al. 2017a). Since fires form a major threat to the survival of this species, it would be appropriate to work on fire and habitat managament and restoration to guarantee the possible recovery, for example by storing plant seeds. Also education and awareness would be appropriate since this species has only been found to occur in a restricted area with potential for local populations to know and support its preservation (Rix et al. 2017b).

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 2.2. Conservation Planning - Area-based Management Plan
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Conservation planning within an area-based management plan could be critical to avoid extinction of the species by possible extensive wildfires. In addition, a monitoring scheme for both the population and habitat could help confirm inferred trends.

Galeosoma robertsi Hewitt, 1916

Species information

Common names

Robert's Shield-Bum Trapdoor Spider (English).

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arhtropoda	Arachnida	Araneae	Idiopidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Afrotropical

Countries:

- South Africa

Map of records (Google Earth):

Suppl. material 14

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Hewitt 1916), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 901

Max Elevation/Depth (m): 1837

Range description

This species has been recorded from South Africa only (Gauteng and North-West Province), but has not been seen since 1915 (Hewitt 1916).

Extent of occurrence

EOO (km2): 0-47227

Trend: Decline (inferred)

Justification for trend

Possibly extinct or so rare that it is on the way to extinction due to habitat loss.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Area of occupancy

AOO (km2): 0-20216

Trend: Decline (inferred)

Justification for trend

Possibly extinct or so rare that it is on the way to extinction due to habitat loss.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Locations

Number of locations: 0-1

Justification for number of locations

There are several records for Pretoria, but all fall within the urban limits of the city. Urbanisation seems to be a major threat to the species. All the records are more than 100 years old.

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Decline (inferred)

Justification for trend

Possibly extinct or so rare that it is on the way to extinction due to habitat loss.

Basis for decline:

- (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Extreme fluctuations?: Unknown

Population Information (Narrative)

Possibly extinct or so rare that it is on the way to extinction due to habitat loss.

Subpopulations

Trend: Decline (inferred)

Justification for trend

Possibly extinct or so rare that it is on the way to extinction due to habitat loss.

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

This species was originally associated with grasslands (Hewitt 1916).

Trend in extent, area or quality?: Decline (inferred)

Justification for trend

Possibly extinct or so rare that it is on the way to extinction due to habitat loss for urbanisation.

Habitat importance: Major Importance

Habitats:

- 4.5. Grassland - Subtropical/Tropical Dry

Ecology

Size: Unknown

Generation length (yr): 0

Dependency of single sp?: No

Ecology and traits (narrative)

Idiopids are called the armoured trapdoor spiders. Idiopids live in burrows and most close it with a lid (Jocque and Dippenaar-Schoeman 2006). They sit and wait for prey, usually medium to large-sized insects. Given their low mobility, colonies are frequently constituted of close relatives.

Threats

Threat type: Ongoing

Threats:

- 1.1. Residential & commercial development - Housing & urban areas
- 1.2. Residential & commercial development - Commercial & industrial areas

Justification for threats

Based on its historical distribution, urbanisation seems to be the largest threat to this species. It is important to note that Pretoria, where most of the specimens were collected, houses the National Collection of Arachnida - people often bring specimens that they catch or photograph here. Yet, as no specimens of this species have been collected or photographed, we suggest that the species is probably extinct.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Conservation action type: Needed

Conservation actions:

- 2.3. Land/water management - Habitat & natural process restoration
- 3.2. Species management - Species recovery
- 3.3. Species management - Species re-introduction
- 3.4. Species management - Ex-situ conservation

Justification for conservation actions

At least part of the historical range of this species is inside protected areas, namely Magaliesberg Biosphere Reserve (UNEP-WCMC and IUCN 2017). If still extant, breeding, recovery and re-introduction of subpopulations in restored habitats would be a priority.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology

- 1.5. Research - Threats

Justification for research needed

If not extinct, basic research is needed to know current distribution in more detail and population size and trends, ecology and traits of the species along with possible threats.

Agyneta flibuscrocus Dupérré, 2013

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- United States

Map of records (Google Earth):

Suppl. material 15

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

Only a single collection of this species is known, from "north of Mt. Washburn, Yellowstone N.P., Wyoming, USA", from 1940 (Dupérré 2013). The range is therefore effectively unknown.

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

No habitat information was listed on the only vial of this species. However, it is from "North of Mt. Washburn", Yellowstone National Park, Wyoming, so we know that the species should live at high elevation (Dupérré 2013). The Yellowstone National Park is located within the ecoregion of temperate coniferous forests (Olson et al. 2001).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Agyneta species build sheet webs under which the spider lives. The web usually has threads both above and below. Once the prey is caught in the web, the prey is bitten from beneath and pulled through the web to be eaten. There is no retreat; if the spider is disturbed, it will flee. Linyphiids usually live in woods or amongst the leaf litter and females commonly deposit their egg sacs on smooth surfaces (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

The only known locality is from within the boundaries of Yellowstone National Park, so at least the known historical range is within a protected area.

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology

- 1.5. Research - Threats

Justification for research needed

Basic research on distribution, population trends, ecology of the species and possible threats is needed.

Agyneta mongolica (Loksa, 1965)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Mongolia
- Korea, Democratic People's Republic of
- Korea, Republic of
- Russian Federation
- China

Map of records (Google Earth):

Suppl. material 16

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Loksa 1965, Tanasevitch 2005, Seyfulina 2005), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 2691

Range description

This species has been recorded from Mongolia and Russia (Loksa 1965, Seyfulina 2005, Tanasevitch 2005) and the species distribution model predicts it to be potentially present in the Korean Peninsula and China as well.

Extent of occurrence

EOO (km2): 5275127

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 3355244

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats

Trend: Stable

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Population Information (Narrative)

No population data is available for this species. However its relatively large range indicates that it likely possesses a large population.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Although the exact habitat of this spider is not recorded, most *Agyneta* reside in the leaf litter layer within forests. The ecoregion across the range of this species is mostly temperate broadleaf and mixed forests but also montane and temperate grasslands and shrublands (Olson et al. 2001).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 2 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Agyneta species build sheet webs under which the spider lives. The web usually has threads both above and below. Once the prey is caught in the web, the prey is bitten from beneath and pulled through the web to be eaten. There is no retreat; if the spider is disturbed, it will flee. Linyphiids usually live in woods or amongst the leaf litter and females commonly deposit their egg sacs on smooth surfaces (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

This species has been reported from the Bolshekhekhtsyrsky Nature Reserve and Verkhne-Bureinsky Nature Reserve so at least part of the range of this species is inside protected areas (Tanasevitch 2005).

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Although the geographic range of this species is large, little is known about the species other than its morphological taxonomy. This includes a lack of knowledge on the habitat, ecology, population size, population trend, habitat trend and possible threats.

Ceratinella brunnea Emerton, 1882

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- Canada
- United States

Map of records (Google Earth):
Suppl. material 17

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Banks 1901, Crosby and Bishop 1925, Chamberlin 1949), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 4507

Range description

This species has been recorded from United states to Canada (Banks 1901, Crosby and Bishop 1925, Chamberlin 1949).

Extent of occurrence

EOO (km2): 25714548

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 25714548

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable.

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

Specimens have been collected across multiple habitat types.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 1.1. Forest - Boreal
- 1.4. Forest - Temperate
- 5.4. Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands

Ecology

Size: 1.45 - 2 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Mature specimens of this species occur from April to November (Kaston 1948). *Ceratinella* are active hunters in the leaf litter.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

Part of the wide range of this species is within protected areas, since it is widepread across USA and Canada (UNEP-WCMC and IUCN 2017). Given its wide distribution and the already existing protected areas, it is not considered to deserve strict conservation concern.

Other

Use type: International

Use type: International

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring of population and habitat trends are needed to confirm the current assessment.

Mansuphantes ovalis (Tanasevitch, 1987)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Georgia
- Turkey
- Armenia
- Azerbaijan
- Russian Federation

Map of records (Google Earth):

Suppl. material 18

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Tanasevitch 1987, Tanasevitch 1990, Ponomarev and Komarov 2013, Martynovchenko and Mikhailov 2014, Ponomarev and Chumachenko 2014), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 5488

Range description

This species has been recorded from Russia, Georgia and Azerbaijan (Tanasevitch 1987, Tanasevitch 1990, Ponomarev and Komarov 2013, Martynovchenko and Mikhailov 2014, Ponomarev and Chumachenko 2014) and the species distribution model predicts it to be present also in Armenia and Turkey.

Extent of occurrence

EOO (km2): 238143

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 121152

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

M. ovalis appears to prefer relatively high altitudes in mixed forests with *Alnus*, *Abies* and/or *Fagus*, amongst litter and under stones (Tanasevitch 1987).

Trend in extent, area or quality?: Stable

Justification for trend

No decline in area or quality is reported.

Habitat importance: Major Importance

Habitats:

- 1.4. Forest - Temperate

Ecology

Size: 1.9 - 2.1 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Mansuphantes build sheet webs under which the spider lives and the sheet web usually has threads both above and below. Once the prey is caught in the web, the prey is bitten from beneath and pulled through the web to be eaten. There is no retreat; if the spider is disturbed, it will flee (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

At least part of the range of this species is protected. It has been recorded within the area of Algeti in Georgia and Caucasus nature reserve and Teberda state reserve in Russia, for instance (Tanasevitch 1990). Therefore, this species is not considered to be of conservation concern.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm suspected population and habitat trends.

Parafroneta marrineri (Hogg, 1909)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Australasian

Countries:

- Australia
- New Zealand

Map of records (Google Earth):

Suppl. material 19

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Hogg 1909, Rainbow 1917, Berland 1931, Hickman 1939, Blest 1979), it was possible to perform species distribution modelling (see methods for details)

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 303

Range description

This species has been recorded from the islands of Macquarie (Australia), Campbell, Auckland and Antipodes (New Zealand) (Hogg 1909, Rainbow 1917, Berland 1931, Hickman 1939, Blest 1979). It is notable that it was last recorded almost 40 years ago.

Extent of occurrence

EOO (km2): 235236

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): 2472

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Number of subpopulations: 4

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Yes

Habitat (narrative)

This species has been found under logs and stones, amongst litter and debris on soil, always on the forest floor. It occurs in a variety of sheltered microhabitats (Blest 1979). The islands, from which this species has been recorded, are mostly bare rock partly covered with grass and shrubs.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 1.3. Forest - Subantarctic

Ecology

Size: 5.3 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Parafroneta species build sheet webs under which the spider lives (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

All of the four islands, where this species occurs, are protected (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Population size, distribution and trends need to be explored in more detail since the last record for this species has been made prior to 1979. Monitoring is needed to know current population and habitat trends.

Pelecopsis alticola (Berland, 1936)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Afrotropical

Countries:

- Rwanda
- Burundi
- Congo, The Democratic Republic of the
- Eritrea
- Ethiopia
- Sudan
- Tanzania, United Republic of
- Uganda
- Kenya

Map of records (Google Earth):
Suppl. material 20

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Fage and Simon 1936, Holm 1962, Miller 1970), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 529

Max Elevation/Depth (m): 4112

Range description

This species should be relatively widespread in East Africa (Fage and Simon 1936, Holm 1962, Miller 1970).

Extent of occurrence

EOO (km2): 2161096

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 830300

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

No population size estimates exist. Widespread species with no known threats.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

This species has been recorded from bamboo forest (Miller 1970), amongst grass and moss at a small stream in rainforest (Holm 1962) and from alpine meadows of Mount Kinangop (Fage and Simon 1936).

Trend in extent, area or quality?: Stable

Habitat importance: Major Importance

Habitats:

- 1.6. Forest - Subtropical/Tropical Moist Lowland
- 4.7. Grassland - Subtropical/High Altitude

Ecology

Size: 2.05 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Pelecopsis species are usually active ground hunters, moving in between the leaf litter.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

At least part of this species range is inside protected areas, namely Maiko National Park in Congo, Awash West in Ethiopia and Mau Forest Reserves in Kenya (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends.

Pelecopsis parallela (Wider, 1834)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Uzbekistan
- Tajikistan
- Iran, Islamic Republic of
- Kazakhstan
- Kyrgyzstan
- Georgia
- Turkey
- Armenia
- Azerbaijan
- Macedonia, the former Yugoslav Republic of
- Poland
- Romania
- San Marino
- Albania
- Latvia
- Liechtenstein
- Lithuania
- Luxembourg
- Belgium
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Czech Republic
- Denmark
- Estonia
- Finland
- Isle of Man
- Jersey
- Germany
- Slovakia
- Slovenia
- Sweden
- Switzerland
- Andorra
- Austria
- Hungary
- Netherlands

- Norway
- Ireland
- Åland Islands
- Montenegro
- Algeria
- Tunisia
- Moldova
- Belarus
- Mongolia
- Portugal
- France
- Greece
- Spain
- United Kingdom
- Italy
- Serbia
- Russian Federation
- Ukraine

Map of records (Google Earth):

Suppl. material 21

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Wider 1834, Koch 1836, Walckenaer 1841, Blackwall 1864, Koch 1879, Simon 1884, Dahl 1886, Chyzer and Kulczynski 1894, Becker 1896, Bosenberg 1902, Roewer 1928, Miller 1947, Locket and Millidge 1953, Miller 1971, Tullgren 1955, Wiehle 1960, Holm 1973, Palmgren 1976, Roberts 1987, Wunderlich 1995, Hormiga 2000, Marusik et al. 2001, Tanasevitch 2008, Marusik 2015, GBIF.org 2018c), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 3460

Range description

This species should be widespread throughout the western palearctic realm (Wider 1834, Koch 1836, Walckenaer 1841, Blackwall 1864, Koch 1879, Simon 1884, Dahl 1886, Chyzer and Kulczynski 1894, Becker 1896, Bosenberg 1902, Roewer 1928, Miller 1947, Locket and Millidge 1953, Miller 1971, Tullgren 1955, Wiehle 1960, Holm 1973, Palmgren 1976,

Roberts 1987, Wunderlich 1995, Hormiga 2000, Marusik et al. 2001, Tanasevitch 2008, Marusik 2015, GBIF.org 2018c).

Extent of occurrence

EOO (km2): 26051004

Trend: Stable

Justification for trend

The extent of occurrence of this species is extremely large and it has been recorded as having a large geographic range as far back as the 19th century (Wider 1834, Koch 1836, Walckenaer 1841, Blackwall 1864, Koch 1879, Simon 1884, Dahl 1886, Chyzer and Kulczynski 1894, Becker 1896). Recent records from the 21st century confirm this large range (GBIF.org 2018c).

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 4862220

Trend: Stable

Justification for trend

The area of occupancy of this species is extremely large and it has been recorded as having a large geographic range as far back as the 19th century (Wider 1834, Koch 1836, Walckenaer 1841, Blackwall 1864, Koch 1879, Simon 1884, Dahl 1886, Chyzer and Kulczynski 1894, Becker 1896). Recent records from the 21st century confirm this large range (GBIF.org 2018c).

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

The exact number of individuals is unknown but it is hypothesised to be extremely large based on the large number of localities from which this species has been recorded.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

This species has been found in a variety of habitats, including grasslands (Wider 1834, Walckenaer 1841, Roewer 1928, Roberts 1987, Marusik 2015), grass steppes (Miller 1947, Wunderlich 1995), forests (Koch 1836, Wiehle 1960, Marusik et al. 2001, Miller 1971) and damp banks in alpine meadows near snow (Simon 1884, Bosenberg 1902). As for microhabitats, it can be found at least under moss (Dahl 1886, Becker 1896, Bosenberg 1902, Roewer 1928, Locket and Millidge 1953, Marusik 2015, Miller 1971), under stones

and debris (Becker 1896, Roewer 1928, Locket and Millidge 1953, Marusik 2015) and within leaf litter (Bosenberg 1902, Roewer 1928, Locket and Millidge 1953, Miller 1971). It is likely a generalist that is able to survive in a variety of temperate and colder habitats.

Trend in extent, area or quality?: Stable

Habitat importance: Major Importance

Habitats:

- 1.1. Forest - Boreal
- 1.4. Forest - Temperate
- 4.1. Grassland - Tundra
- 4.4. Grassland - Temperate
- 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)
- 5.10 Wetlands (inland) - Tundra Wetlands (incl pools and temporary waters from snowmelt)
- 5.11. Wetlands (inland) - Alpine Wetlands (incl temporary waters from snowmelt)
- 5.13. Wetlands (inland) - Permanent Inland Deltas
- 6. Rocky areas (e.g. inland cliffs, mountain peaks)

Ecology

Size: 1 - 1.5 mm (male), 1.5 - 1.8 mm (female)

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Pelecopsis species are active ground hunters, moving in between the leaf litter.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

The range of this species is enormous and covers a variety of national parks, protected wildlife areas and other natural areas protected by law (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends.

Scotinotylus sacer (Crosby, 1929)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- Greenland
- Russian Federation
- Canada
- United States

Map of records (Google Earth):

Suppl. material 22

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Crosby 1929, Holm 1967, Millidge 1981, Eskov and Marusik 1994), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 3161

Range description

This is a holarctic species recorded from Canada, Alaska and Greenland (Denmark) (Crosby 1929, Holm 1967, Millidge 1981, Eskov and Marusik 1994) and the species distribution model predicts it could be present also in Russia in the area close to the Bering Strait.

Extent of occurrence

EOO (km2): 9331949

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 2531284

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

A widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

This species has been reported mostly in litter and in moss (Crosby 1929, Holm 1967) which indicates they live mostly in forest habitats in the boreal zone. It is often collected in willow thickets, herb covers on a slope, *Empetrum vaccinium uliginosum* heath and *Carex* bogs, but rarely found under rocks (Marusik 2015).

Trend in extent, area or quality?: Stable

Habitat importance: Major Importance

Habitats:

- 1.1. Forest - Boreal
- 5.4. Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands

Ecology

Size: 1.6 - 1.8 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Scotinotylus build sheet webs under which the spider lives, the web usually having threads both above and below. Once the prey is caught in the web, it is bitten from beneath and pulled through the web to be eaten. There is no retreat; if the spider is disturbed, it will flee (Dippenaar-Schoeman and Jocqué 1997).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

At least part of the range of this species is within protected areas in USA and Canada (UNEP-WCMC and IUCN 2017). Given the wide distribution and the already existing protected areas, it is not considered as of conservation concern.

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends.

Tapinocyba suganamii Saito & Ono, 2001

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- Japan

Map of records (Google Earth):

Suppl. material 23

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Saito and Ono 2001), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 1562

Range description

This species has been recorded from Japan, Honshu Island only and last recorded in 1998 (Saito and Ono 2001).

Extent of occurrence

EOO (km2): 37465

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): 10800

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

Japan is covered with temperate broadleaf and mixed forests (Olson et al. 2001). Otherwise, the preferred habitat of this species is unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 1.30 - 1.40 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Tapinocyba spiders are small active hunters across a variety of substrates.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

At least part of the species range is inside protected areas, for example Chichibu Tama Kai National Park and several smaller natural parks and protected areas in the NE part of the range (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Tiso aestivus (L. Koch, 1872)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Kazakhstan
- Georgia
- Turkey
- Armenia
- Azerbaijan
- Macedonia, the former Yugoslav Republic of
- Poland
- Romania
- San Marino
- Albania
- Latvia
- Liechtenstein
- Lithuania
- Luxembourg
- Belgium
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Czech Republic
- Denmark
- Estonia
- Faroe Islands
- Finland

- Isle of Man
- Germany
- Greenland
- Slovakia
- Slovenia
- Sweden
- Switzerland
- Andorra
- Austria
- Hungary
- Iceland
- Netherlands
- Norway
- Ireland
- Åland Islands
- Montenegro
- Moldova
- Belarus
- Portugal
- France
- Greece
- Spain
- United Kingdom
- Italy
- Serbia
- Russian Federation
- Ukraine
- Japan

Map of records (Google Earth):

Suppl. material 24

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Chyzer and Kulczynski 1894, Braendegaard 1946, Tullgren 1955, Thaler 1970, Miller 1971, Palmgren 1976, Roberts 1987, Agnarsson 1996, Ono et al. 2009, Marusik 2015), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 3422

Range description

This species has been recorded from several countries in Europe, from Iceland to Slovenia and it has also been recorded from Japan (Chyzer and Kulczynski 1894, Braendegaard 1946, Tullgren 1955, Thaler 1970, Miller 1971, Palmgren 1976, Roberts 1987, Agnarsson 1996, Ono et al. 2009, Marusik 2015). The species distribution model predicts it to be a relatively widespread species throughout Europe.

Extent of occurrence

EOO (km2): 34307231

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 6462816

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread population with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist, but it is a widespead and common species.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

This species occurs in moist places such as snow beds often associated with *Sibbaldia-Salix herbacea*, lichen heaths on mountain slopes and herb fields in dry localities (Marusik et al. 2015). Records have been made also in high alpine grass heaths (at 2000-3030 m elevation), in Northern Europe at lower altitudes under spruces and in birch forests associated with lichens (Thaler 1970).

Trend in extent, area or quality?: Stable

Habitat importance: Major Importance

Habitats:

- 1.1. Forest - Boreal
- 1.4. Forest - Temperate
- 4.1. Grassland - Tundra
- 4.4. Grassland - Temperate

Ecology

Size: 1.5 - 2 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Tiso species are ground dwellers, hunting actively for small insects.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

The predicted range of this species is large, ranging from Europe to Asia, including several protected areas (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm population and habitat trends of this species across its range.

Troxochrus triangularis Tanasevitch, 2013

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Palestinian Territory, Occupied
- Lebanon
- Syrian Arab Republic
- Israel

Map of records (Google Earth):

Suppl. material 25

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Tanasevitch 2013), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): -210

Max Elevation/Depth (m): 2266

Range description

This species is only known from three localities, all in fragmented forests (Tanasevitch 2013). The species distribution model predicts it to be spread over a larger area in Israel and surrounding countries.

Extent of occurrence

EOO (km2): 23839

Trend: Decline (inferred)

Justification for trend

Possible loss of EOO due to loss and fragmentation of forest area in the region.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 17048

Trend: Decline (inferred)

Justification for trend

Possible loss of AOO due to loss and fragmentation of forest area in the region.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Decline (inferred)

Justification for trend

Inferred from decline in AOO and possibly decrease in habitat quality.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: Yes

Extreme fluctuations?: Unknown

Subpopulations

Trend: Unknown

Severe fragmentation?: Yes

Justification for fragmentation

Although we do not know the number of individuals of this species, we assume its population to be severely fragmented, as it has been recorded exclusively in small forest patches of which probably more than 50% are smaller than needed to guarantee the survival of the species (Tanasevitch 2013).

Habitat

System: Terrestrial

Habitat specialist: Yes

Habitat (narrative)

This species has been collected exclusively in small forest patches (Tanasevitch 2013).

Trend in extent, area or quality?: Decline (observed)

Justification for trend

Loss and fragmentation of forests in Israel and surrounding countries.

Habitat importance: Major Importance

Habitats:

- 1.4. Forest - Temperate

Ecology

Size: 1.50 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Troxochrus are ground dwellers, actively hunting for small arthropods.

Threats

Threat type: Ongoing

Threats:

- 5.3. Biological resource use - Logging & wood harvesting

Justification for threats

Since this species lives in forests which cover only a small proportion of Israel, habitat fragmentation is a real threat affecting this species with over 2000 ha lost between 2001 and 2016 (Global Forest Watch 2014).

Conservation

Conservation action type: Needed

Conservation actions:

- 1.2. Land/water protection - Resource & habitat protection
- 3.3. Species management - Species re-introduction

Justification for conservation actions

The preservation and recovery of forests in the region would be the only way to guarantee the survival of the species.

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Basic research is needed to confirm the current distribution and population size and trends, along with the species ecology and biotic and abiotic requirements. Monitoring is needed to know future population and habitat trends.

Arabelia pheidoleicomes Bosselaers, 2009

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Liocranidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Cyprus
- Turkey
- Greece

Map of records (Google Earth):

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Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records, last recorded in 2008 (Bosselaers 2009, Seyyar et al. 2016), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 1464

Range description

This species has been recorded from Greece, Turkey and Cyprus (Bosselaers 2009, Seyyar et al. 2016).

Extent of occurrence

EOO (km2): 524155

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 197120

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

Specimens of *A. pheidoleicomes* have been found under stones and amongst litter and debris in pine and chestnut forests, under stones in beaches and near waters and in dry grasslands and fields. Some records were associated with ants and termites, including in their nests (Bosselaers 2009, Bosmans 2011, Seyyar et al. 2016).

Trend in extent, area or quality?: Stable

Habitat importance: Major Importance

Habitats:

- 1.4. Forest - Temperate
- 4.4. Grassland - Temperate
- 13.3. Marine Coastal/Supratidal - Coastal Sand Dunes

Ecology

Size: 3.5 mm (male); 2.74 mm (female)

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Liocranids are free-living spiders commonly found on the ground in forest litter (Jocque and Dippenaar-Schoeman 2006). This species was suggested to be clearly myrmecophylic since *A. pheidoleicomes* was found under stones along with yellow ants of the species *Pheidole pallidula* (Nylander, 1849) at least in Laerma (Rhodos)(Bosselaers 2009). The only male recorded was found in a termite nest, whereas females were always collected associated with ants (Bosmans 2011). On the other hand, later collected specimens of *A. pheidoleicomes* were not observed in the company of ants even though the collection site was suitable for them (Seyyar et al. 2016). Males were observed in April, females from March to May.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

There are several protected areas within the range of this species (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.5. Research - Threats
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends, along with possible threats across this species range.

Neoanagraphis pearcei Gertsch, 1941

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Liocranidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- Mexico
- United States

Map of records (Google Earth):

Suppl. material 27

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Gertsch 1941, Vetter 2001, GBIF.org 2018b), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 351

Max Elevation/Depth (m): 2434

Range description

This species has been recorded from the south-western United States (Gertsch 1941, Vetter 2001, GBIF.org 2018b) and the SDM predicts suitable habitat also in northern Baja California, Mexico.

Extent of occurrence

EOO (km2): 454348

Trend: Stable

Justification for trend

The review of this genus was undertaken by Vetter (2001) in which he collected, recorded and mapped the distribution records of *N. pearcei* since 1960. There are no new records of this species known since 2001 (GBIF.org 2018b), the determination of a trend is not possible and we asssume it to be stable.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 303552

Trend: Stable

Justification for trend

A single review of this genus was undertaken by Vetter (2001) in which he collected, recorded and mapped the distribution records of *N. pearcei* since 1960. There are no new

records of this species known since 2001 (GBIF.org 2018b), the determination of a trend is not possible.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable.

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown.

Trend: Stable

Justification for trend

We assume the population to be stable.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

N. pearcei has been recorded from sand dunes (Vetter 2001), from grasslands (*Coloegyne-Grayia-Ephedra*-grass) and associated with *Grayia spinosa* and *Lycium andersonii*, *Larrea divaricata* and *Franseria dumosa* and *Salsola kali* (Allred and Gertsch 1975). This species had also been found in *Aphonopelma* burrows (Vetter 2001).

Trend in extent, area or quality?: Stable

Justification for trend

Although it is known that desertification is increasing in this part of the United States (United States Department of Agriculture 2003), it is unknown whether or not this species prefers sand dunes or grasslands for its habitat.

Habitat importance: Major Importance

Habitats:

- 4.4. Grassland - Temperate
- 8.2. Desert - Temperate

Ecology

Size: 6 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Liocranids are free-living spiders commonly found on the ground in forest litter. Often accompanied with ants or termites. Species of the same genus have been collected from burrows of mammals and large spiders. A female from the genus *Neoanagraphis* has been observed to feed on *Drosophila* flies and small crickets but refused mosquitoes, larval waxmoth and spiders (Vetter 2001).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection

Justification for conservation actions

There are many protected areas (national parks, nature reserves, wilderness areas etc.) within the range of this species in the south-western US (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

There is only the most basic biology known about this species (morphologic taxonomy and very basic habitat data). Population trends, life history and possible unidentified threats should be assessed.

Arctosa villica (Lucas, 1846)

Species information

Synonyms

Arctosa brevialva (Franganillo, 1913)

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Andorra
- Algeria
- Morocco
- Portugal
- France
- Spain
- Italy

Map of records (Google Earth):

Suppl. material 28

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Simon 1876, Caporiacco 1941, Roewer 1960, Lugetti and Tongiorgi 1965, Guy 1966, Barrientos 1979, Murphy and Tongiorgi 1979, Melic 1994), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 3237

Range description

A. villica is widespread around the western Mediterranean area (Simon 1876, Caporiacco 1941, Roewer 1960, Lugetti and Tongiorgi 1965, Guy 1966, Barrientos 1979, Murphy and Tongiorgi 1979, Melic 1994).

Extent of occurrence

EOO (km2): 2235745

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 842352

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records, but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable

Justification for number of locations

No known threats to this species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Some of the specimens were found on "Spanish mountains" (Simon 1876), under rocks and detritus (Roewer 1960) and meadows (Breitling et al. 2016). Habitats are mostly within the ecoregion of Mediterranean forests, woodlands and scrub (Olson et al. 2001).

Trend in extent, area or quality?: Stable

Habitat importance: Major Importance

Habitats:

- 4.4. Grassland - Temperate

Ecology

Size: 13 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Only females of *A. villica* have been found in early April and they either had egg sacs with them or laid eggs after they have been captured. One female was observed in the lab and, by the end of April, her offspring hatched and climbed on to her back. The mother lived until June and, after that, the offspring ate her (Murphy and Tongiorgi 1979).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

Many parts of the range of this species are within proctected areas, so it is not considered to be of conservation concern (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm population and habitat trends.

Hippasa greenalliae (Blackwall, 1867)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- Bangladesh
- Bhutan
- Sri Lanka
- Nepal
- India

Map of records (Google Earth):

Suppl. material 29

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Blackwall 1867, Karsch 1892, Pocock 1900, Tikader and Malhotra 1980, Gajbe 2003, Patel 2003, Biswas and Raychaudhuri 2007, Dey et al. 2013, Keswani 2014, Keswani and Ganesh 2014, More 2015, Saha et al. 2016, Vaibhav et al. 2017), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 2520

Range description

This species has been recorded from several sites in India, Sri Lanka and Bangladesh (Blackwall 1867, Karsch 1892, Pocock 1900, Tikader and Malhotra 1980, Gajbe 2003, Patel 2003, Biswas and Raychaudhuri 2007, Dey et al. 2013, Keswani 2014, Keswani and Ganesh 2014, More 2015, Saha et al. 2016, Vaibhav et al. 2017). The species distribution model predicts suitable habitat also in Nepal and Bhutan.

Extent of occurrence

EOO (km2): 3130705

Trend: Stable

Justification for trend

A widespread species able to adapt to a variety of habitat types.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 1733128

Trend: Stable

Justification for trend

A widespread species able to adapt to a variety of habitat types.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable.

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

This species is known from tropical evergreen and semi-evergreen forests and in moist teak forests, as well as Southern Indian moist deciduous forests and riparian fringing forests (Patel 2003). It has also been recorded in household gardens (Dey et al. 2013), citrus (Keswani 2014), banana (Keswani and Ganesh 2014), tea (Saha et al. 2016) and sugar-cane (Srikanth et al. 1997) plantations.

Trend in extent, area or quality?: Stable

Justification for trend

This species seems to be well adapted to many habitat types, including man-made, the habitat trend being stable.

Habitat importance: Major Importance

Habitats:

- 1.6. Forest - Subtropical/Tropical Moist Lowland
- 14.3. Artificial/Terrestrial - Plantations
- 14.4. Artificial/Terrestrial - Rural Gardens

Ecology

Size: 6 - 7 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Species of the genus *Hippasa* stay in their retreat for the day and wait for prey at the entrance during the night. They build funnel webs like agelenid spiders (Tanikawa 2006). In banana agroecosystems, *H. greenalliae* used the base of pseudostems in sheet webs provided with a funnel (Keswani and Ganesh 2014).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

Many parts of this species range are within protected areas (UNEP-WCMC and IUCN 2017). In addition, this species seems to adapt to a variety of different habitats, even modified by humans, e.g. plantations and therefore it is not considered to be of conservation concern.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Important

Ecosystem services:

- 12. Biocontrol

Justification for ecosystem services

Since this species has been recorded from agro-ecosystems, it may be useful for humans in controlling the abundance of pests.

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends.

Hogna exsiccatella (Strand, 1916)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Neotropical

Countries:

- Guatemala

Map of records (Google Earth):

Suppl. material 30

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

Only one female specimen has been recorded from an unspecified locality in Guatemala, prior to 1916 (Strand 1916).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Guatemala is mostly covered with tropical and subtropical moist broadleaf forests (Olson et al. 2001). However, since the locality of this species is unspecified, the preferred habitat remains unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 15 mm

Generation length (yr): 0

Dependency of single sp?: No

Ecology and traits (narrative)

Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and after hatching the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Hogna kankunda Roewer, 1959

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Afrotropical

Countries:

- Congo, The Democratic Republic of the

Map of records (Google Earth):

Suppl. material 31

Basis of EOO and AOO: Unknown

Basis (narrative)

Unkown EOO or AOO.

Range description

This species is known only from the type locality in Kankunda, Congo, recorded in 1949 (Roewer 1959).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

Population size and trend are unknown.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

A single specimen was found from a tributary of a river (Roewer 1959).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)

Ecology

Size: 12 - 18 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and after hatching the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Lycosa fuscana Pocock, 1901

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- India

Map of records (Google Earth):

Suppl. material 32

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species has been recorded originally from Maharashtra, India (Pocock 1901). There are also two records for Tasmania, Australia (GBIF.org 2018a) which should be confirmed.

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

Population size and trend are unknown.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Maharashtra is located within the ecoregion of deserts and xeric shrublands (Olson et al. 2001). Today, there seems to be mostly fields and human settlements. Since this species was recorded over one hundred years ago from an unspecifed locality, habitat preference remains unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 14 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and after hatching the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Lycosa goliathus Pocock, 1901

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- India

Map of records (Google Earth):

Suppl. material 33

Basis of EOO and AOO: Unknown

Basis (narrative)

Only three records known, all from Western India (Pocock 1901, Tikader and Malhotra 1980, Patel and Vyas 2001).

Min Elevation/Depth (m): 252

Max Elevation/Depth (m): 585

Range description

This species has been recorded from Maharashtra and Gujarat in India, last recorded in 1998 (Pocock 1901, Tikader and Malhotra 1980, Patel and Vyas 2001).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Maharashtra and Gujarat are located within the ecoregion of deserts and xeric shrublands (Olson et al. 2001). When examining the satellite map, the area is mostly covered with fields and dry scrubs. Otherwise, the preferred habitat of this species remains unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 32 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and after hatching the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

Koyna National Park is located in the area where the species was recorded and may occur inside this protected area as well (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Lycosa iranii Pocock, 1901

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan
- Palearctic

Countries:

- Pakistan
- India

Map of records (Google Earth):

Suppl. material 34

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Patel and Vyas 2001, Malik et al. 2015, Pocock 1901), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 675

Range description

This species is known from India, specifically in Maharashtra and Gujarat and it was last recorded in 1998 (Patel and Vyas 2001, Malik et al. 2015, Pocock 1901). Suitable habitat may also exist along the south-eastern coast of Pakistan.

Extent of occurrence

EOO (km2): 492170

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): 154616

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Maharashtra and Gujarat are located within the ecoregion of deserts and xeric shrublands (Olson et al. 2001). When examining satellite images, there seems to be mostly fields and dry scrubs. Otherwise, the preferred habitat of this species remains unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 16.5 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and after hatching the mother carries the

juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

At least part of the species range is inside protected areas, namely Runn of Kutch Wildlife Sanctuary in Pakistan, Kachchh Desert Sanctuary and Gir Sanctuary in India (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.5. Research - Threats
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Research on possible threats and monitoring is needed to identify current population and habitat trends across species range.

Pardosa izabella Chamberlin & Ivie, 1942

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Neotropical

Countries:

- Guatemala

Map of records (Google Earth):

Suppl. material 35

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species is only known from the type locality Chichivac, Guatemala, recorded in 1934 (Chamberlin and Ivie 1942).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

The type locality is covered with tropical and subtropical moist broadleaf and coniferous forests (Olson et al. 2001). Habitat preference of this particular species is unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 5.9 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to know current distribution and population size and trends along with possible threats.

Pardosa kupupa (Tikader, 1970)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arhtropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- Uzbekistan
- Afghanistan
- Tajikistan
- Pakistan
- Kazakhstan
- Kyrgyzstan
- Bhutan
- Nepal
- India
- Myanmar
- China

Map of records (Google Earth):

Suppl. material 36

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Tikader 1970, Song 1982, Song et al. 1999, Sen et al. 2015, Dhali et al. 2017), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 2634

Max Elevation/Depth (m): 6485

Range description

This species is recorded only from India (Tikader 1970, Sen et al. 2015) and China (Song 1982, Song et al. 1999, Dhali et al. 2017), although possibly occurring in several neighbouring countries.

Extent of occurrence

EOO (km2): 4568361

Trend: Stable

Justification for trend

A widespread species able to adapt to a variety of habitat types.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 2851908

Trend: Stable

Justification for trend

A widespread species able to adapt to a variety of habitat types.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable.

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

No specific habitat was described for any of the records. Yet, *P. kupupa* was recorded in Gorumara National Park in India, where the forest type was described as follows: terai grassland, riverine forests, dry mixed forests, wet mixed forests and sal forests (Sen et al. 2015). It seems to prefer high altitude habitats.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 1.9. Forest - Subtropical/Tropical Moist Montane
- 4.7. Grassland - Subtropical/High Altitude

Ecology

Size: 5 - 7 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Ecology for this species is unknown. Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection
- 2.1. Land/water management - Site/area management

Justification for conservation actions

There are several protected areas inside the range of *P. kupupa*, specifically this species has been recorded inside Gorumara National Park and in Buxa Tiger Reserve in Jalpaiguri, West Bengal in India (Dhali et al. 2017, Sen et al. 2015).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends across the species range.

Pardosa novitatis (Strand, 1906)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Afrotropical

Countries:

- Ethiopia

Map of records (Google Earth):

Suppl. material 37

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species has been recorded from Ethiopia prior to 1906 (Strand 1906, Strand 1908).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

The habitat preference of this particular species is unknown. Ethiopia is mostly covered with tropical and subtropical grasslands, savannahs and shrublands with patches of tropical and subtropical dry and moist broadleaf forests (Olson et al. 2001).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 7.5 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Ecology for this species is unknown. Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Pardosa pusiola (Thorell, 1891)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- Viet Nam
- Bangladesh
- Bhutan
- Cambodia
- Sri Lanka
- Thailand
- Nepal
- Lao People's Democratic Republic
- Malaysia
- India
- Indonesia
- Myanmar
- Hong Kong
- China

Map of records (Google Earth):

Suppl. material 38

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Simon 1905, Gravely 1924, Schenkel 1963, Tikader and Malhotra 1980, Yongqiang 1992, Yin et al. 1995, Song et al. 1999, Biswas and Raychaudhuri 2003, WANG and ZHANG 2014, Pan et al. 2016, Dhali et al. 2017, GBIF.org 2018f), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 2724

Range description

This species is common and widespread throughout SE Asia (Simon 1905, Gravely 1924, Schenkel 1963, Tikader and Malhotra 1980, Yongqiang 1992, Yin et al. 1995, Song et al. 1999, Biswas and Raychaudhuri 2003, WANG and ZHANG 2014, Pan et al. 2016, Dhali et al. 2017, GBIF.org 2018f).

Extent of occurrence

EOO (km2): 11980702

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 1655304

Trend: Stable

Justification for trend

Any definite range change over time was not available in the records but we assume it to be stable being a widespread species.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable.

Justification for number of locations

No known threats to the species.

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

This species has been recorded from tropical botanical gardens (Pan et al. 2016), citrus orchards (Yongqiang 1992) and from submontane lowland forests of Dooars (Dhali et al. 2017).

Trend in extent, area or quality?: Stable

Habitat importance: Major Importance

Habitats:

- 1.6. Forest - Subtropical/Tropical Moist Lowland
- 14.3. Artificial/Terrestrial - Plantations

Ecology

Size: 6 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Ecology for this species is unknown. Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at

night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

This species has been recorded, for example, inside Gorumara National Park (Dhali et al. 2017), Purna Wildlife sanctuary (Siliwal et al. 2003) and Rani Veerangana Wildlife Sanctuary (Patil et al. 2013). There seems to be a lot of protected areas inside the predicted range of this species (UNEP-WCMC and IUCN 2017) and therefore, it is not considered of conservation concern.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Important

Ecosystem services:

- 12. Biocontrol

Justification for ecosystem services

Possible biocontrol services in orchards and other plantations.

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends.

Pardosa sinensis Yin, Wang, Peng & Xie, 1995

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arhtropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Palearctic

Countries:

- China

Map of records (Google Earth):

Suppl. material 39

Basis of EOO and AOO: Unknown

Basis (narrative)

Unkown EOO or AOO.

Range description

Only known from an unspecified locality in China (Yin et al. 1995).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Habitat preference of this particular species is unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 5.8 - 6.2 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Ecology for this species is unknown. Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Schizocosa avida (Walckenaer, 1837)

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic
- Neotropical

Countries:

- Guatemala
- Belize
- El Salvador
- Mexico
- Costa Rica
- Honduras
- Nicaragua
- Canada
- United States

Map of records (Google Earth):

Suppl. material 40

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Blackwall 1846, Whitcomb et al. 1963, Turnbull 1966, Agnew et al. 1985, Breene et al. 1993, Durán-Barrón et al. 2009), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 3014

Range description

This species is widely distributed in the southern parts of North America and Central America (Blackwall 1846, Whitcomb et al. 1963, Turnbull 1966, Agnew et al. 1985, Breene et al. 1993, Durán-Barrón et al. 2009).

Extent of occurrence

EOO (km2): 11109899

Trend: Stable

Justification for trend

No definite range change is noticeable in the available records.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Area of occupancy

AOO (km2): 4197556

Trend: Stable

Justification for trend

No definite range change is noticeable in the available records.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Locations

Number of locations: Not applicable.

Justification for number of locations

No known threats to the species.

Trend: Stable

Population

Number of individuals: Unknown

Trend: Stable

Justification for trend

Widespread species with no known threats.

Causes ceased?: Yes

Causes understood?: Yes

Causes reversible?: Yes

Subpopulations

Trend: Stable

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

This species has been recorded from cotton ecosystems (Breene et al. 1993), peanut and sandy fields and pasturelands (Agnew et al. 1985, Turnbull 1966, Whitcomb et al. 1963). Also found in urban habitats such as houses (Durán-Barrón et al. 2009).

Trend in extent, area or quality?: Stable

Justification for trend

This species has been observed in various habitats, including urban settings.

Habitat importance: Major Importance

Habitats:

- 4.4. Grassland - Temperate
- 14.1. Artificial/Terrestrial - Arable Land
- 14.2. Artificial/Terrestrial - Pastureland
- 14.5. Artificial/Terrestrial - Urban Areas

Ecology

Size: 6 - 14 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Ecology for this species is unknown. Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

Many parts of this species range are within proctected areas, so it is not considered to be of conservation concern (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to confirm current population and habitat trends across the species range.

Trochosa longa Qu, Peng & Yin, 2010

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arhtropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- Myanmar
- China

Map of records (Google Earth):

Suppl. material 41

Basis of EOO and AOO: Unknown

Basis (narrative)

Despite a relatively high number of records (Qu et al. 2010), the species distribution models were not found to be reasonable by our own expert opinion. Hence, only observed records are presented.

Min Elevation/Depth (m): 2083

Max Elevation/Depth (m): 3278

Range description

This species was only recently described and there is only one paper on it. The only records are from Yunnan, China, last recorded in 2006 (Qu et al. 2010), very close to the Burmese border.

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative)

The specimens were collected from Yunnan Gaoligong Mountains, both in a village and along a road (Qu et al. 2010). Yunnan is a mountainous region covered with tropical and subtropical moist broadleaf forests (Olson et al. 2001).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 1.9. Forest - Subtropical/Tropical Moist Montane

Ecology

Size: 6.05 - 6.75 mm

Generation length (yr): 1

Dependency of single sp?: No

Ecology and traits (narrative)

Ecology for this species is unknown. Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

This species has been recorded from protected areas, namely Gaoligongshan Nature Reserve and Three Parallel Rivers of Yunnan Protected Areas World Heritage site (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Zenonina fusca Caporiacco, 1941

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arhtropoda	Arachnida	Araneae	Lycosidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Afrotropical

Countries:

- Ethiopia

Map of records (Google Earth):

Suppl. material 42

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

Originally described from "El Banno" in the region between Sagan River and Omo (currently a National Park) in Ethiopia (Caporiacco 1941). Roewer (1959) mentions the species from Sud-Abyssinia.

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

There are no recorded habitat data for this species. However, species of the same genus were found from the savannah biome, mainly consisting of bushveld vegetation, grassland with scattered *Acacia* trees and bush clumps (Dippenaar et al. 2008), mixed woodland and undisturbed sand forest (Haddad et al. 2009). Ethiopia is mostly covered with tropical and subtropical grasslands, savannahs and shrublands with patches of tropical and subtropical dry and moist broadleaf forests (Olson et al. 2001).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 7 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Ecology for this species is unknown. Lycosids are free-living, ground-dwelling spiders, mostly living in burrows or seeking refuge under rocks. These spiders are usually active at night when they actively forage. The female carries egg cocoons in her spinnerets and, after hatching, the mother carries the juveniles on her abdomen from a few days to a few weeks (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to know current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Pua novaezealandiae Forster, 1959

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Micropholcommatidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Australasian

Countries:

- New Zealand

Map of records (Google Earth):

Suppl. material 43

Basis of EOO and AOO: Species Distribution Model

Basis (narrative)

Given the relatively high number of records (Forster 1959, Rix and Harvey 2010), it was possible to perform species distribution modelling (see methods for details).

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 2266

Range description

According to the species distribution model, this species seems to be relatively widespread almost throughout the islands of New Zealand, although last recorded in 1977 (Forster 1959, Rix and Harvey 2010).

Extent of occurrence

EOO (km2): 183303

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): 46784

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

Known only from forests, where it occupies leafmounds, mosses and lichens (Forster 1959, Rix and Harvey 2010).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 1.4. Forest - Temperate

Ecology

Size: 0.70 - 1.30 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

These are very small spiders and very little is known about their lifestyle. They have been observed to build tangled webs similar to those of Theridiidae (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

The species distribution model predicts part of the range of this species to be within protected areas (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.3. Research - Life history & ecology
- 1.5. Research - Threats
- 3.1. Monitoring - Population trends
- 3.4. Monitoring - Habitat trends

Justification for research needed

Monitoring is needed to identify current population and habitat trends across the species range. Little is known about the life history of this species and therefore more data need to be collected along with possible threats.

Mosu huogou Miller, Griswold & Yin, 2009

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Mysmenidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Indomalayan

Countries:

- China

Map of records (Google Earth):

Suppl. material 44

Basis of EOO and AOO: Unknown

Basis (narrative)

Unkown EOO or AOO.

Range description

This species is known only from the type locality in China, within the Gaoligongshan region, recorded in 2006 (Miller et al. 2009).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Number of subpopulations: Unknown

Trend: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

This species has been found in leaf litter of subtropical evergreen broadleaf forest (Miller et al. 2009).

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 1.6. Forest - Subtropical/Tropical Moist Lowland

Ecology

Size: 0.92 mm

Generation length (yr): 1

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Not much is known about the ecology of mysmenids, but some species have been observed to be kleptoparasites on the webs of other spiders. They are commonly found in leaf litter in humid habitats or in rock crevices and the webs can vary from three-dimensional to sheet-like (Jocque and Dippenaar-Schoeman 2006).

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 1.2. Land/water protection - Resource & habitat protection

Justification for conservation actions

The only record made for this species seems to be inside a protected area, namely Gaoligongshan Nature Reserve in China and, in addition, there are also other protected areas nearby where this species may occur (UNEP-WCMC and IUCN 2017).

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species, along with possible threats.

Calisoga sacra Chamberlin, 1937

Species information

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Nemesiidae

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Nearctic

Countries:

- United States

Map of records (Google Earth):

Suppl. material 45

Basis of EOO and AOO: Unknown

Basis (narrative)

Unknown EOO or AOO.

Range description

This species is known only from the type locality in Sacramento, California, recorded prior to 1937 (Chamberlin 1937).

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Population Information (Narrative)

No population size estimates exist.

Subpopulations

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative)

The type locality is mostly desert and xeric shrublands (Olson et al. 2001) and currently heavily cultivated and urbanised areas. Otherwise, the preferred habitat of this species remains unknown.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: 18 mm

Generation length (yr): 0

Dependency of single sp?: Unknown

Ecology and traits (narrative)

Nemesiids live in burrows lined with silk and most close it with a lid (Jocque and Dippenaar-Schoeman 2006). They sit and wait for prey, usually medium to large-sized insects. Given their low mobility, colonies are frequently constituted by close relatives.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats

No known threats to the species.

Other

Use type: International

Use and trade:

- 18. Unknown

Ecosystem service type: Very important

Research needed:

- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed

Basic research is needed to identify current distribution and population size and trends, ecology and traits of the species along with possible threats.

Acknowledgements

We thank Robert Bosmans for providing unpublished information. Paulo Borges, Nicola Mumford and Rogerio Bertani reviewed and provided useful advice on previous versions of the manuscript. Paula Cushing helped organising a red-listing workshop during the XXth International Congress of Arachnology, Golden, Colorado, July 2016, where this project

started. The Chicago Zoological Society CBOT Endangered Species Fund made such workshop possible through targeted funding.

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Supplementary materials

Suppl. material 1: Distribution of *Berlandina kolosvaryi* Caporiacco, 1947 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Berlandina kolosvaryi.kml - Download file (4.06 kb)

Suppl. material 2: Distribution of *Drassyllus excavatus* (Schenkel, 1963) doi

Authors: Cardoso, P.

Data type: Distribution
Filename: Drassyllus excavatus (Schenkel, 1963).kml - Download file (10.86 kb)

Suppl. material 3: Distribution of *Gnaphosa kankhalae* Biswas & Roy, 2008 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Gnaphosa kankhalae Biswas & Roy, 2008.kml - Download file (3.94 kb)

Suppl. material 4: Distribution of *Gnaphosa tenebrosa* Fox, 1938 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Gnaphosa tenebrosa Fox, 1938.kml - Download file (4.05 kb)

Suppl. material 5: Distribution of *Leptodrassus croaticus* Dalmas, 1919 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Leptodrassus croaticus Dalmas, 1919.kml - Download file (3.94 kb)

Suppl. material 6: Distribution of *Orodrassus coloradensis* (Emerton, 1877) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Orodrassus coloradensis.kml - Download file (198.24 kb)

Suppl. material 7: Distribution of *Scotophaeus nigrosegmentatus* (Simon, 1895) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Scotophaeus nigrosegmentatus (Simon, 1895).kml - Download file (14.35 kb)

Suppl. material 8: Distribution of *Urozelotes mysticus* Platnick & Murphy, 1984 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Urozelotes mysticus.kml - Download file (7.45 kb)

Suppl. material 9: Distribution of *Zelotes anthereus* Chamberlin, 1936 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Zelotes anthereus Chamberlin, 1936.kml - Download file (188.00 kb)

Suppl. material 10: Distribution of *Zelotes ashae* Tikader & Gajbe, 1976 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Zelotes ashae Tikader & Gajbe, 1976.kml - Download file (10.92 kb)

Suppl. material 11: Distribution of *Zelotes mulanjensis* FitzPatrick, 2007 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Zelotes mulanjensis FitzPatrick, 2007.kml - Download file (3.91 kb)

Suppl. material 12: Distribution of *Cantuaria wanganuiensis* (Todd, 1945) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Cantuaria wanganuiensis (Todd, 1945).kml - Download file (7.60 kb)

Suppl. material 13: Distribution of *Cataxia bolganupensis* (Main, 1985) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Cataxia bolganupensis (Main, 1985).kml - Download file (2.27 kb)

Suppl. material 14: Distribution of *Galeosoma robertsi* Hewitt, 1916 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Galeosoma robertsi Hewitt, 1916.kml - Download file (378.31 kb)

Suppl. material 15: Distribution of *Agyneta flibuscrocus* Dupérré, 2013 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Agyneta flibuscrocus.kml - Download file (4.00 kb)

Suppl. material 16: Distribution of *Agyneta mongolica* (Loksa, 1965) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Agyneta mongolica (Loksa, 1965).kml - Download file (121.26 kb)

Suppl. material 17: Distribution of *Ceratinella brunnea* Emerton, 1882 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Ceratinella brunnea Emerton, 1882.kml - Download file (316.80 kb)

Suppl. material 18: Distribution of *Mansuphantes ovalis* (Tanasevitch, 1987) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Mansuphantes ovalis (Tanasevitch, 1987).kml - Download file (318.87 kb)

Suppl. material 19: Distribution of *Parafroneta marrineri* (Hogg, 1909) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Parafroneta marrineri (Hogg, 1909).kml - Download file (2.43 kb)

Suppl. material 20: Distribution of *Pelecopsis alticola* (Berland, 1936) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Pelecopsis alticola.kml - Download file (81.21 kb)

Suppl. material 21: Distribution of *Pelecopsis parallela* (Wider, 1834) doi

Authors: Cardoso, P.
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Suppl. material 22: Distribution of *Scotinotylus sacer* (Crosby, 1929) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Scotinotylus sacer (Crosby, 1929).kml - Download file (920.89 kb)

Suppl. material 23: Distribution of *Tapinocyba suganamii* Saito & Ono, 2001 doi

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Data type: Distribution
Filename: Tapinocyba suganamii Saito & Ono, 2001.kml - Download file (131.30 kb)

Suppl. material 24: Distribution of *Tiso aestivus* (L. Koch, 1872) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Tiso aestivus (L. Koch, 1872).kml - Download file (530.64 kb)

Suppl. material 25: Distribution of *Troxochrus triangularis* Tanasevitch, 2013 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Troxochrus triangularis.kml - Download file (155.99 kb)

Suppl. material 26: Distribution of *Arabelia pheidoleicomes* Bosselaers, 2009 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Arabelia pheidoleicomes Bosselaers, 2009.kml - Download file (42.56 kb)

Suppl. material 27: Distribution of *Neoanagraphis pearcei* Gertsch, 1941 doi

Authors: Cardoso, P.
Data type: Distribution

Filename: Neoanagraphis pearcei Gertsch, 1941.kml - Download file (34.77 kb)

Suppl. material 28: Distribution of *Arctosa villica* (Lucas, 1846) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Arctosa villica.kml - Download file (73.95 kb)

Suppl. material 29: Distribution of *Hippasa greenalliae* (Blackwall, 1867) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Hippasa greenalliae (Blackwall, 1867).kml - Download file (52.72 kb)

Suppl. material 30: Distribution of *Hogna exsiccatella* (Strand, 1916) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Hogna exsiccatella (Strand, 1916).kml - Download file (4.04 kb)

Suppl. material 31: Distribution of *Hogna kankunda* Roewer, 1959 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Hogna kankunda Roewer, 1959.kml - Download file (4.03 kb)

Suppl. material 32: Distribution of *Lycosa fuscana* Pocock, 1901 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Lycosa fuscana Pocock, 1901.kml - Download file (3.94 kb)

Suppl. material 33: Distribution of *Lycosa goliathus* Pocock, 1901 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Lycosa goliathus Pocock, 1901.kml - Download file (10.90 kb)

Suppl. material 34: Distribution of *Lycosa iranii* Pococks, 1901 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Lycosa iranii Pococks, 1901.kml - Download file (472.07 kb)

Suppl. material 35: Distribution of *Pardosa izabella* Chamberlin & Ivie, 1942 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Pardosa izabella Chamberlin & Ivie, 1942.kml - Download file (4.03 kb)

Suppl. material 36: Distribution of *Pardosa kupupa* (Tikader, 1970) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Pardosa kupupa.kml - Download file (182.46 kb)

Suppl. material 37: Distribution of *Pardosa novitatis* (Strand, 1916) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Pardosa novitatis (Strand, 1916).kml - Download file (7.38 kb)

Suppl. material 38: Distribution of *Pardosa pusiola* (Thorell, 1891) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Pardosa pusiola.kml - Download file (132.01 kb)

Suppl. material 39: Distributon of *Pardosa sinensis* in, Wang, Peng & Xie, 1995 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Pardosa sinensis.kml - Download file (7.40 kb)

Suppl. material 40: Distribution of *Schizocosa avida* (Walckenaer, 1837) doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Schizocosa avida (Walckenaer, 1837).kml - Download file (179.81 kb)

Suppl. material 41: Distribution of *Trochosa longa* Qu, Peng & Yin, 2010 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Trochosa longa Qu, Peng & Yin, 2010.kml - Download file (14.29 kb)

Suppl. material 42: Distribution of *Zenonina fusca* Caporiacco, 1941 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Zenonina fusca Caporiacco, 1941.kml - Download file (3.93 kb)

Suppl. material 43: Distribution of *Pua novaezealandiae* Forster, 1959 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Pua novaezealandiae Forster, 1959.kml - Download file (1.12 MB)

Suppl. material 44: Distribution of *Mosu huogou* Miller, Griswold & Yin, 2009 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Mosu huogou Miller, Griswold & Yin, 2009.kml - Download file (3.94 kb)

Suppl. material 45: Distribution of *Calisoga sacra* Chamberlin, 1937 doi

Authors: Cardoso, P.
Data type: Distribution
Filename: Calisoga sacra Chamberlin, 1937.kml - Download file (4.04 kb)