**Use Case 2 - IUCN Red List Assessments**

Use Case 2 is a practice use case for the data processing and assessing conservation status modules.

Please note that this use case is fictitious and built for instructional purposes using data downloaded from [www.gbif.org](http://www.gbif.org). Any reference to countries and structures/organisations, real or otherwise, within those countries are used merely to facilitate the use of the data and do not reflect the reality within those countries.

## Description of the use case

Mexico is a mega-diverse country with high numbers of species and high levels of endemism across all taxonomic groups. The government is committed to assessing the conservation status of all its species and has agreed to develop a national red list applying IUCN Categories and Criteria to all vertebrate and invertebrate taxonomic groups by the year 2030. As part of this process, they have started the assessment of arachnid groups and are now assessing the conservation status of all species within the family Theraposidae – the tarantulas.

National and international arachnid specialists have come together at a Mexican arachnid red list workshop and they will now be assessing the conservation status of the tarantula species *Brachypelma smithi* (F.O.Pickard-Cambridge, 1897) and Aphonopelma anax  (Chamberlin, 1940). Assessors want to use GBIF-mediated data to assess the species using Criterion B and provide maps that comply to IUCN documentation requirements.

## Data Collection

Brachypelma smithi (F.O.Pickard-Cambridge, 1897) is a large spider species in the family Theraphosidae. It has a very restricted range within the state of Guerrero, requiring clearings in tropical dry forests on sandy soil where it can build its tunnel/den. As with other tarantula species, males and females have different lifespans with averages of 6 and 25 years respectively. Both males and females reach sexual maturity on average after 4 years. The species plays a role in local indigenous culture where it is considered a vessel for the souls of community members and is thus afforded protection where the species is found near local, indigenous communities. The species is threatened by the collection of individuals for the pet trade and is listed under CITES Appendix II; it is highly prized by collectors due to its rarity.

Aphonopelma anax (Chamberlin, 1940) ) is a large spider species in the family Theraphosidae. It is found in Southern Texas, USA and North Mexico. They are found in semiarid climates in grasslands and shrub forests as well as within cities. They live in burrows that can be created by themselves or modifying suitable habitats such as dead trees, empty rodent burrows, stacks of wood or natural crevices. They have slow growth rates and live for several years before maturing – females can live up to 40 years while males rarely live over 2 years once they have matured. The species is common across its range and although there has been increasing urban and agricultural development across its range in both the USA and Mexico, the extent of this development is limited to only a small portion of the species entire range.

## Data use description and data quality requirements

*Figure STYLEREF 1 \s 0. SEQ Figure \\* ARABIC \s 1 1 Distribution of available GBIF-mediated georeferenced Gymnosarda unicolor occurrence data.*

* You should download datasets from [www.gbif.org](http://www.gbif.org) for *Brachypelma smithi*  and Aphonopelma anax

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| Figure 1. Distribution of available GBIF-mediated georeferenced *Brachypelma smithi* occurrence data. | Figure 2. Distribution of available GBIF-mediated georeferenced Aphonopelma anax  occurrence data. |

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### Exercise 1 - Data Processing

You should download datasets from [www.gbif.org](http://www.gbif.org) for *Brachypelma smithi*  and *Aphonopelma anax*. There is a step-by-step guide or R markdown document provided to you to guide you through this exercise

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| Q1. What are the taxonkeys for each of the species and what is the taxonomic status of each species? |
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| Q2. In what format did you download the data and what are the unique properties of this type of download? |
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| Q3. What are the DOIs of your downloads? |
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| Q4. Which of the following key data quality processing steps did you use for cleaning both datasets? For each requirement, what is your justification? |
| Default geospatial issues  Absence records  Fossils and living specimens  Establishment Means  Old records  Uncertain location  Bad default values for coordinate uncertainty  Points along the Equator or prime meridian  Country centroids  Duplicate removal  Outliers  Metagenomics  Outside Native ranges  Gridded datasets  Automated identification |
| Q5. What additional data processing steps might you want to validate taxonomic identification of species? |
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| Q6. As these will be national red list assessments, what additional data processing step will be required for the non-endemic *Aphonopelma anax* dataset? |
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## Exercise 2 - Applying IUCN Red List Criterion B

### In this exercise, you will calculate the Extent of Occurrence and Area of Occupancy for Brachypelma smithi and Aphonopelma anax using GeoCat - [www.geocat.kew.org](http://www.geocat.kew.org) and then do Red List assessments for the species. Remember Aphonopelma anax will be a national assessment and not a global assessment.

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| *Brachypelma smithi* (F.O.Pickard-Cambridge, 1897) | | |
| **Extent of Occurrence** |  | |
| **Area of Occupancy** |  | |
|  | | **Justification** |
| **Severe Fragmentation** |  |  |
| **No. of Locations** |  |  |
| **Continuing Decline** |  |  |
| **Extreme Fluctuations** |  |  |
| **Final Assessment** |  | |

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| *Aphonopelma anax (Chamberlin, 1940)* | | |
| **Extent of Occurrence** |  | |
| **Area of Occupancy** |  | |
|  | | **Justification** |
| **Severe Fragmentation** |  |  |
| **No. of Locations** |  |  |
| **Continuing Decline** |  |  |
| **Extreme Fluctuations** |  |  |
| **Final Assessment** |  | |

**Exercise 3 - Producing a Species Distribution Map**

In this exercise, you will create a species distribution map for *Brachypelma smithi* and *Aphonopelma anax* applying IUCN mapping standards. Please use the step-by-step guide to guide you through this exercise. Note: For assessments that are accompanied by points only, it is recommended, if possible and appropriate, that a polygon map representing the distribution is also provided.

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| Q1. Provide the point attributes table in line with IUCN mapping standards for *Brachypelma smithi* and *Aphonopelma anax* including core, recommended and optional fields for the species distribution map using the processed GBIF data download for this species |
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| Q2. Using the Nature Conservancy Terrestrial Ecosystems dataset provided, what might be appropriate ecosystems to base a polygon map of the limits of a taxon´s distribution for both species? |
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| Q3. If these were freshwater species, what would be an appropriate GIS layer to use for creating polygon maps? |
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| Q4. Provide a polygon map for each of the species. |
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| Q5. What would be appropriate citations for the use of these data? |
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