The IUCN Red List
A brief introduction
What is the IUCN Red List?

*World’s most comprehensive information source for extinction risk of species.*

- Not just a list, but a compilation of the conservation status of species at the global level
- Based on the best scientific information available
- Widely used to inform and influence biodiversity conservation
IUCN Red List Goal

To provide information and analyses on the status, trends and threats to species in order to inform and catalyse action for biodiversity conservation.
The aims:

• Establish a baseline from which to monitor the change in status of species

• Provide a global context for the establishment of conservation priorities at the local level

• Monitor, on a continuing basis, the status of a representative selection of species (as biodiversity indicators) that cover all the major ecosystems of the world
Arthroleptella lightfooti

**Taxonomy**

- Kingdom: ANIMALIA
- Phylum: CHORDATA
- Class: AMPHIBIA
- Order: ANURA
- Family: PYXICEPHALIDAE

**Scientific Name:** Arthroleptella lightfooti

**Species Authority:** Boulenger, 1916

**Common Name/s:**
- English: Lightfoot's Moss Frog

**Assessment Information**

- **Red List Category & Criteria:** Near Threatened (ver 3.1)
- **Year Assessed:** 2010
- **Assessors:** South African Frog Re-assessment Group (SA-FRoG) & IUCN SSC Amphibian Specialist Group.
- **Reviewers:** Argulic, A. & Cisneros-Heredia, D.F.
- **Contributors:** Channing, A., Turner, A., de Villiers, A., Harvey, J., Tarrant, J., Masey, J., Tolley, K., Minter, L., du Preez, L., Burger, M., Cunningham, M. & Davies, S.

**Justification:**

Although this species qualifies for Endangered under B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv), it has been listed as Near Threatened because it is relatively abundant within its small Extent of Occurrence (134 km²) and the current threats are not considered to be severe. However, the extent and quality of its habitat are probably declining a little suggesting that it may become threatened.

**History:** 2004 – Near Threatened
### Geographic Range [top]

<table>
<thead>
<tr>
<th>Range Description</th>
<th>This species is endemic to Table Mountain and to the other mountains of the Cape Peninsula, South Africa, where it occurs from sea level up to 1,000 m asl. It is very restricted with a small Extent of Occurrence (134 km²) and an Area of Occupancy estimated to be 10%.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries</td>
<td><strong>Native:</strong> South Africa (Western Cape Province)</td>
</tr>
<tr>
<td>Range Map</td>
<td>(click map to view full version)</td>
</tr>
</tbody>
</table>

### Population [top]

<table>
<thead>
<tr>
<th>Population</th>
<th>This species appears to be relatively abundant on the Cape Peninsula. Fire and post-fire impacts on number of mature individuals are expected to cause large fluctuations in subpopulation sizes (as in other members of this genus) but the species as a whole should be buffered against these fluctuations by the relatively large number of locations (currently estimated to be 10).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Trend</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

### Habitat and Ecology [top]

<table>
<thead>
<tr>
<th>Habitat and Ecology</th>
<th>It is a species of fynbos heathland and forest that does not survive in developed areas. Breeding is by direct development, with 5-12 eggs being laid in moss or similar vegetation in wet mosey areas near rivers, hilly or roadside seepages, and heavily vegetated streams.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems</td>
<td>Terrestrial</td>
</tr>
</tbody>
</table>

### Threats [top]
Threats [top]

Major Threat(s): Even though its habitat is largely protected, the major threats to this species are the spread of alien species (in particular pines) and too frequent or intense fires which cause extreme population fluctuations. Increased tourism in the area needs to be properly managed to minimise impact. There has probably been some loss of habitat in the past due to urban development and pine plantations on parts of the mountains.

List of Threats:
1. Residential & commercial development
   1.1 Housing & urban areas
   1.2 Tourism & recreation areas
   1.3 Agriculture & aquaculture
   1.4 Wood & pulp plantations
   2.1 Small-holder plantations
   2.2.1 Agro-industry plantations
   7. Natural system modifications
   7.1 Fire & the suppression
   7.1.1 Trend Unknown/Unrecorded
   8. Invasive & other problematic species & genes
   8.1 Invasive non-native alien species
   8.1.1 Unspecified species

Conservation Actions [top]

Conservation Actions:
No conservation actions are currently prioritised for this species; however, monitoring programs are required to determine population trends. Most of this species’ range is in Table Mountain National Park and Kirstenbosch Botanic Gardens and thus potential impacts from tourism need to be properly managed. Results from research need to be placed into a management framework for active conservation measures, inclusive of invasive species control.

List of Conservation Actions:
2. Landwater management
   2.1 Site/area management
   2.2 Invasive/problematic species control

Bibliography [top]


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Components of a Red List assessment

1. Red List category and criteria

- Purple Skimmer *Libellula jesseana*
- Vulnerable A2a;B2ab(iii)

- Documentation supporting the category and criteria
  - Population size, trend and status; range; threats; conservation measures; etc.

- Map of species’ distribution
What can be assessed?

IUCN Red List Categories and Criteria are used to assess:

- **All described taxa** (species, subspecies, varieties), except micro-organisms
- Undescribed taxa, **only if** they are:
  - A clearly distinct species
  - Museum/herbarium voucher references are provided
  - Distribution information is available
  - There is clear conservation benefit to assessing the species
- At the **global level**
- At the **regional/national level** only with the *Guidelines for Application of IUCN Red List Criteria at Regional Levels*
- **Wild populations** inside their **natural range** (including populations resulting from benign introductions)
RED LIST ASSESSMENT PROCESS
Who is involved in producing a Red List assessment?

**Project Managers**
• Coordinate assessment projects; finalize assessments; liaise between assessors/reviewers/IUCN RLU

**Assessors**
• Provide data; apply the Red List Categories and Criteria considering all relevant data

**Contributors** (optional)
• Provide data and contribute knowledge to the assessment, but do not apply the Red List C&C

**Reviewers**
• Review each assessment before publication to ensure data is comprehensive and accurate

**IUCN Red List Unit**
• Final assessment sign-off; manage Red List database/website; field petitions and enquiries
Assessment Review Process

Within IUCN network
- Specialist Groups, Red List Authorities
- Global Biodiversity Assessment projects
- IUCN-led regional projects

Outside IUCN
- Regional/national assessments (endemic species)
- Other external assessors

Reviewers
- At least 1 for every assessment

Assessors

Unreviewed assessment

Reviewed Assessment

Quality-checked, reviewed assessments

IUCN Red List Unit
ROLE OF A RED LIST ASSESSOR
What does a Red List Assessor do?

1. Compile all currently available data on population status, distribution, ecology, use/trade, threats & conservation measures:
   - Across the species’ entire global range
   - Data may come from published studies, unpublished reports, grey literature, personal knowledge, etc.
   - Assign a Red List category and criteria based on the available information
   - Justify the assessment following the documentation requirements
   - Prepare a range map following the mapping standards
   - Know who to submit the assessment to for review and submission to the IUCN Red List Unit.
How can Red List Assessors ensure assessments are rigorous and defensible?

- Understand the Categories & Criteria and apply them properly
- Justify the assessments with thorough supporting data
- Follow the documentation standards
- Provide relevant references
- Submit a good map
- Double check for consistency and for errors
- Work with other relevant groups doing Red List assessments

High quality assessments get published more quickly – better for conservation!
IUCN Red List Categories
The IUCN Categories

- Extinct (EX)
- Extinct in the Wild (EW)
- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near Threatened (NT)
- Least Concern (LC)
- Data Deficient (DD)
- Not Evaluated (NE)
- Adequate data

Extinction Risk

Possibly Extinct CR(PE) or CR(PEW)
Changing Red List Category

There are various reasons for a species to change category:

• NON-GENUINE status change
  • New information
  • Taxonomic changes
  • Incorrect data used previously
  • Criteria revision (version 2.3 (1994) versus version 3.1 (2001))
  • Knowledge of the criteria

• GENUINE status change
The Five Year Rule

Genuine deterioration in status: uplist to higher threat category immediately
The Five Year Rule

Genuine improvement in status: downlist to lower threat category only when the higher category thresholds have not been met for FIVE years

Population Size

First assessment: CR
CR thresholds no longer met
5 years
Can reassess and update documentation, but category must remain as for first assessment: CR
Reassess and alter status appropriately

Time (yrs)
Data Quality & Uncertainty
Dealing with a lack of high quality data

- The threatened categories use quantitative thresholds
- **BUT** a lack of high quality data should not deter assessors from applying the IUCN criteria.
### A. Population size reduction

Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

<table>
<thead>
<tr>
<th></th>
<th>Critically Endangered</th>
<th>Endangered</th>
<th>Vulnerable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A1</strong></td>
<td>≥ 90%</td>
<td>≥ 70%</td>
<td>≥ 50%</td>
</tr>
<tr>
<td><strong>A2, A3 &amp; A4</strong></td>
<td>≥ 80%</td>
<td>≥ 50%</td>
<td>≥ 30%</td>
</tr>
</tbody>
</table>

- **A1** Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased.
- **A2** Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.
- **A3** Population reduction projected, inferred or suspected to be met in the future (up to a maximum of 100 years), [(a) cannot be used for A3]
- **A4** An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

*based on any of the following:*

(a) direct observation [Except A3]
(b) an index of abundance appropriate to the taxon
(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality
(d) actual or potential levels of exploitation
(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

### B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)

<table>
<thead>
<tr>
<th></th>
<th>Critically Endangered</th>
<th>Endangered</th>
<th>Vulnerable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B1. Extent of occurrence (EOO)</strong></td>
<td>&lt; 100 km²</td>
<td>&lt; 5,000 km²</td>
<td>&lt; 20,000 km²</td>
</tr>
<tr>
<td><strong>B2. Area of occupancy (AOO)</strong></td>
<td>&lt; 10 km²</td>
<td>&lt; 500 km²</td>
<td>&lt; 2,000 km²</td>
</tr>
</tbody>
</table>

AND at least 2 of the following 3 conditions:

(a) Severely fragmented OR Number of locations
   - = 1
   - ≤ 5
   - ≤ 10

(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals.

(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals.

### C. Small population size and decline
**Observed**

Observed information is directly based on well-documented observations of all known individuals in the population.

For example: **entire** global population occurs in only one area and **all** individuals counted each year.

- Year 1 population = 19
- Year 2 population = 17
- Year 3 population = 15
- Year 4 population = 8

Observed 58% decline over 4 years.
Estimated information is based on calculations that may involve assumptions and/or interpolations in time (in the past).

For example: repeated surveys of sample sites across total range

<table>
<thead>
<tr>
<th>Date</th>
<th>Site A</th>
<th>Site B</th>
<th>Site C</th>
<th>Site D</th>
<th>All</th>
<th>Population size estimate across total range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>105</td>
<td>110</td>
<td>210</td>
<td>59</td>
<td>484</td>
<td>2,000</td>
</tr>
<tr>
<td>2006</td>
<td>101</td>
<td>107</td>
<td>70</td>
<td>40</td>
<td>318</td>
<td>1,300</td>
</tr>
<tr>
<td>2007</td>
<td>90</td>
<td>100</td>
<td>25</td>
<td>42</td>
<td>257</td>
<td>1,000</td>
</tr>
<tr>
<td>2008</td>
<td>63</td>
<td>81</td>
<td>0</td>
<td></td>
<td>177</td>
<td>700</td>
</tr>
</tbody>
</table>

Estimated 65% decline between 2005 and 2008
Projected information is the same as “estimated”, but the variable of interest is extrapolated in time towards the future.

For example: repeated surveys of sample sites across total range with knowledge of ongoing causes of population decline.
Inferred information is based on variables that are indirectly related to the variable of interest, but in the same general type of units (e.g. number of individuals or area or number of subpopulations). Relies on more assumptions than estimated data.

For example: Past and current population sizes are not known, but trade figures for that species have declined over time.

Inferred continuing decline in population size based on decline in trade statistics for this species.
Inferred

Examples:

• Continuing decline in population size inferred from declining trade statistics

• Continuing decline in area of occupancy inferred from rate of habitat loss

• Population reduction (% decline) inferred from change in catch statistics (e.g. CPUE)

Based on indirect evidence – on variables that are indirectly related to the variable of interest, but in the same general type of units (e.g. number of individuals or area or number of subpopulations). Relies on more assumptions than estimated/projected data.
Red List Criteria & the Criteria Summary Sheet
Nature of the Criteria

CRITERIA

A
Population reduction

B
Restricted geographic range

C
Small population size & decline

D
Very small or restricted population

E
Quantitative analysis

THREATENED CATEGORIES

Critically Endangered (CR)

Endangered (EN)

Vulnerable (VU)

Quantitative thresholds
Why use multiple criteria?

Not all the criteria are appropriate to all taxa.

• All taxa being assessed must be evaluated against each criterion.
• Meeting any one of the criteria qualifies a taxon for listing at that level of threat
• All criteria met at the highest level of threat should be listed.
SUMMARY OF THE FIVE CRITERIA (A-E) USED TO EVALUATE IF A TAXON BELONGS IN AN IUCN RED LIST THREATENED CATEGORY (CRITICALLY ENDANGERED, ENDANGERED OR VULNERABLE).  

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Critically Endangered</th>
<th>Endangered</th>
<th>Vulnerable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Population size reduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>&gt; 80%</td>
<td>&gt; 50%</td>
<td>≥ 30%</td>
</tr>
<tr>
<td>A2, A3 &amp; A4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>Population reduction projected, inferred or suspected to be met in the future (up to a maximum of 100 years) (a) cannot be estimated (A3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4</td>
<td>An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max of 100 years in future), and where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Geographic range in the form of extent of occurrence (EOO) AND/ OR area of occupancy (AOO)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Extent of occurrence (EOO)</td>
<td>&lt; 100 km²</td>
<td>&lt; 5,000 km²</td>
</tr>
<tr>
<td>B2</td>
<td>Area of occupancy (AOO)</td>
<td>&lt; 10 km²</td>
<td>&lt; 500 km²</td>
</tr>
<tr>
<td>AND at least 2 of the following 3 conditions:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>Severely fragmented OR Number of locations ≤ 1</td>
<td>≤ 5</td>
<td>≤ 10</td>
</tr>
<tr>
<td>(b)</td>
<td>Continuing decline observed, estimated, inferred or suspected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of mature individuals; (v) number of subpopulations; (vi) number of locations or subpopulations; (vii) number of mature individuals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of mature individuals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Small population size and decline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of mature individuals</td>
<td>&lt; 250</td>
<td>&lt; 2,500</td>
<td>&lt; 10,000</td>
</tr>
<tr>
<td>AND at least one of C1 or C2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C1</td>
<td>An observed, estimated or projected continuing decline of at least (up to a max of 100 years in future):</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>25% in 3 years or 1 generation (whichever is longer).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>An observed, estimated, projected or inferred continuing decline AND at least 1 of the following 3 conditions:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>(i) Number of mature individuals in each subpopulation ≤ 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii) % of mature individuals in one subpopulation = 90-100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Extreme fluctuations in the number of mature individuals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Very small or restricted population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of mature individuals</td>
<td>&lt; 50</td>
<td>&lt; 250</td>
<td>&lt; 1,000</td>
</tr>
<tr>
<td>D2. Only applies to the VU category</td>
<td>Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EN in a very short time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicating the probability of extinction in the wild to be</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)</td>
<td>≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)</td>
<td>≥ 10% in 100 years</td>
<td></td>
</tr>
</tbody>
</table>