

# THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

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The Minister approved this conservation advice and included this species in the Endangered category, effective from 11/05/2018

## Conservation Advice

### *Cryptoblepharus gurrmul*

Arafura snake-eyed skink

#### **Summary of assessment**

##### **Conservation status**

*Cryptoblepharus gurrmul* has been found to be eligible for listing in the Endangered category, as outlined in the attached assessment.

##### **Reason for conservation assessment by the Threatened Species Scientific Committee**

This advice follows assessment of information provided by the Northern Territory as part of the Common Assessment Method process, to systematically review species that are inconsistently listed under the EPBC Act and relevant state/territory legislation or lists.

More information on the Common Assessment Method is available at:

<http://www.environment.gov.au/biodiversity/threatened/cam>

The information in this assessment has been compiled by the relevant state/territory government. In adopting this assessment under the EPBC Act, this document forms the Approved Conservation Advice for this species as required under s266B of the EPBC Act.

##### **Public consultation**

Notice of the proposed amendment and a consultation document was made available for public comment for 33 business days between 3 October 2017 and 16 November 2017. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process.

##### **Recovery plan**

A recovery plan for this species under the EPBC Act is not recommended, because the Approved Conservation Advice provides sufficient direction to implement priority actions and mitigate against key threats. The relevant state/territory may decide to develop a plan under its equivalent legislation.

#### **Recommendations**

- (i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the Endangered category:  
*Cryptoblepharus gurrmul*
- (ii) The Committee recommends that there not be a recovery plan for this species.

Threatened Species Scientific Committee

28 February 2018

# Assessment summary

Current conservation status				
Scientific name:	<i>Cryptoblepharus gurrmul</i> (Horner 2007) Previously <i>Cryptoblepharus</i> sp. (New Year and Oxley Islands)			
Common name:	Arafura Snake-eyed Skink			
Family name:	SCINCIDAE	Fauna <input checked="" type="checkbox"/>	Flora <input type="checkbox"/>	
Nomination for:	Listing <input checked="" type="checkbox"/>	Change of status/criteria <input type="checkbox"/>	Delisting <input type="checkbox"/>	
1. Is the species currently on any conservation list, either in a State or Territory, Australia or Internationally? 2. Is it present in an Australian jurisdiction, but not listed?			Provide details of the occurrence and listing status for each jurisdiction in the following table	
Jurisdiction	State / Territory in which the species occurs	Date listed or assessed (or N/A)	Listing category i.e. critically endangered or 'none'	Listing criteria i.e. B1ab(iii)+2ab(iii)
International (IUCN Red List)				
National (EPBC Act)			Not listed	
State / Territory	1. Northern Territory	2002	Endangered	B1,2ab(i,ii,iii,v)
Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:				
<ul style="list-style-type: none"> <li>this assessment meets the standard of evidence required by the Common Assessment Method to document the eligibility of the species under the IUCN criteria;</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:				
<ul style="list-style-type: none"> <li>surveys of the species were adequate to inform the assessment;</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Systematic surveys and brief searches on other islands in the region (coastal Arnhem Land) found the species on Templar and Valencia Islands in 2009 but did not detect it elsewhere (Mahney <i>et al</i> 2010).			
<ul style="list-style-type: none"> <li>the conclusion of the assessment remains current and that any further information that may have become available since the assessment was completed supports or is consistent with the conclusion of the assessment.</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	The previous assessment of the species' conservation status in the NT (2002) was based on the species' then-known distribution at three islands. The species is now known from five islands but the fundamentals of restricted range and small number of locations remains.			

Nominated national conservation status					
Extinct (EX) <input type="checkbox"/>		Critically Endangered (CR) <input type="checkbox"/>		Endangered (EN) <input checked="" type="checkbox"/>	
Vulnerable (VU) <input type="checkbox"/>		Not listed <input type="checkbox"/>		Extinct in the Wild (EW) <input type="checkbox"/>	
				Conservation Dependent (CD) <input type="checkbox"/>	
What are the IUCN Red List criteria that support the recommended conservation status category?			See <i>Evidence on Listing Eligibility and Conservation Actions</i> document below for details		
Summary of assessment information					
EOO		3060km <sup>2</sup>		AOO	
				84km <sup>2</sup> (based on 2km x 2km grids)	
				Generation length	
				Unknown but probably 2-3 years	
No. locations		5		Severely fragmented	
				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>	
No. subpopulations		5		No. mature individuals	
				unknown	
Percentage global population within Australia				100%	
Percentage population decline over 10 years or 3 generations				unknown	
Threats (detail how the species is being impacted)					
Threat <i>(describe the threat and how it impacts on the species. Specify if the threat is past, current or potential)</i>			Extent <i>(give details of impact on whole species or specific subpopulations)</i>		Impact <i>(what is the level of threat to the conservation of the species)</i>
The species is restricted to five small islands in an area with an annual cyclone risk. It forages among rocks, coral litter and driftwood in the upper littoral zone and shelters in fringing vegetation. Cyclones have the potential to cause considerable damage to such habitats. The five islands are relatively close together, such that single cyclonic events are likely to impact the whole population. (current and future)			100% of the species' population		Medium
Climate change is likely to result in higher intensity cyclones and storm surges, resulting in more frequent damage to the habitat. (future)			100% of the species' population		Medium
Climate change is also likely to result in a rise in sea level that will dramatically change the coastlines of these islands and the associated coastal habitats. The majority of land on the islands is less than 5 m above sea level. Across the total 83 km of coastline from the 5 islands where the species is known to occur, 51% is beach and 47 % is rocky (based on Smartline Maps <a href="http://www.ozcoasts.gov.au/coastal/smartline.jsp">www.ozcoasts.gov.au/coastal/smartline.jsp</a> and Google Earth (Smartline does not classify coastline of New Year Island); accessed March 2017). 63% of the coastline is backed by sand.  It is difficult to predict how sea-level changes will interact with changes in currents and influence the future distribution of the			100% of the species' population		High

rocks and coral rubble used by these skinks, high on beaches. However, with the high proportion of sandy coastal habitats on these islands, the coastline is prone to inundation, erosion and realignment. (future)		
Introduced pests, such as black rats, have the potential to devastate island populations of small vertebrates. The most likely source for such pests is fishing vessels – international and local. (future)	0% of the species' population currently Possible impact, one island at a time	Zero Possibly medium-high
The highly fragmented nature of the species' distribution exacerbates the potential impacts of the four threats listed above. Recolonisation of the small islands is highly unlikely in any short to medium timeframe. (current and future)	100% of the species' population	Medium
<b>Management and Recovery</b>		
Is there a Recovery Plan (RP) or Conservation Management Plan operational for the species?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p><i>List all relevant recovery or management plans (including draft, in-preparation, out-of-date, national and State/Territory recovery plans, recovery plans for other species or ecological communities, or other management plans that may benefit or be relevant to the nominated species).</i></p> <ul style="list-style-type: none"> <li>No specific plans.</li> <li>Threat abatement plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 hectares <a href="http://www.environment.gov.au/biodiversity/threatened/publications/tap/reduce-impacts-exotic-rodents-biodiversity-australian-offshore">http://www.environment.gov.au/biodiversity/threatened/publications/tap/reduce-impacts-exotic-rodents-biodiversity-australian-offshore</a></li> </ul>		
<p><i>List current management or research actions, if any, that are being undertaken that benefit the conservation of the species.</i></p> <ul style="list-style-type: none"> <li>No current management or research actions.</li> </ul>		
<p><i>List further recommended management or research actions, if any, that would benefit the conservation of the species. Please ensure that this section addresses all identified threats.</i></p> <p>Management priorities are to:</p> <ol style="list-style-type: none"> <li>reduce the possibility of introduction of any new predators to these islands;</li> <li>evaluate the potential impact of climate change and sea-level rise on the species; and</li> <li>consider spreading the risk of extinction by translocation of some individuals to other suitable islands or nearby mainland.</li> </ol> <p>The primary research priority is to better evaluate the species' population size and ecological requirements.</p>		
<b>Date submitted:</b>	19 December 2016	
<i>Experts consulted in preparing the nomination:</i>		

Summary of subpopulation information <i>(detailed information to be provided in the relevant sections of the form)</i>						
Location <i>(include coordinates)</i>	Land tenure	Survey information: Date of survey and No. mature individuals	Area of subpopulat ions	Site / habitat Condition	Threats <i>(note if past, present or future)</i>	Specific management actions
Oxley island	Indigenous land trust	1982 (no population data collected)	1.9 km <sup>2</sup>	littoral habitats, including beach sands, rocks and coral rubble	Cyclones and sea-level-rise (present and future), introduced species (future)	See attached document.
New Year Island	Indigenous land trust	1979 (no population data collected)	0.77 km <sup>2</sup>	littoral habitats, including beach sands, rocks and coral rubble	Cyclones and sea-level-rise (present and future), introduced species (future)	See attached document.
North Goulburn Island	Indigenous land trust	2006 (no population data collected)	39.7 km <sup>2</sup>	littoral habitats, including beach sands, rocks and coral rubble	Cyclones and sea-level-rise (present and future), introduced species (future)	See attached document.
Templar Island	Indigenous land trust	2009 1 individual – incidental observation	1.2 km <sup>2</sup>	littoral habitats, including beach sands, rocks and coral rubble	Cyclones and sea-level-rise (present and future), introduced species (future)	See attached document.
Valencia Island	Indigenous land trust	2009 1 individual captured across 6 survey sites	2.9 km <sup>2</sup>	littoral habitats, including beach sands, rocks and coral rubble	Cyclones and sea-level-rise (present and future), introduced species (future)	See attached document.

## Evidence on Listing Eligibility and Conservation Actions 2016

### *Cryptoblepharus gurrmul* (Arafura Snake-eyed Skink)

**Proposed Action:** Australian Government to list under EPBC

**Notes:**

**Taxonomy**

Conventionally accepted as *Cryptoblepharus gurrmul* (Horner 2007) (SCINCIDAE) (formerly *Cryptoblepharus* sp. New Year and Oxley Islands)

**Nominated Status:** Endangered (B1,2ab(i,ii,iii,v))

**Current EPBC Act status:** *Not listed*

**Current TPWC Act status:** Endangered (B1ab(i,ii,iii,iv,v))

**Species Information**

**Description**

The Arafura snake-eyed skink is a small slender, relatively long limbed, shallow headed species of snake-eyed skink, with dark, ovate scales on palms and heels of the feet. There are five digits on each foot and hand. It generally has a grey-brown to blackish colour, with a longitudinally aligned, complex body pattern dominated by dark, broad vertebral zone and obscure, pale stripes on flanks. The intensity of body pigmentation and patterning is variable, ranging from obscure to prominent.

This species was previously referred to as *Cryptoblepharus* sp. New Year and Oxley Islands, but its taxonomy has been resolved (Horner, 2007).

**Distribution**

The known distribution is restricted to five islands: North Goulburn Island (39 km<sup>2</sup>), and four small (about 2 km<sup>2</sup>) islands, New Year, Oxley, Templar and Valencia northeast of Croker Island, Northern Territory. Their distribution is highly fragmented: New Year and Oxley islands lie approximately 20 km apart and their distance to the larger North Goulburn Island is about 75 km, Valencia and Templar have 10km between them and lie approx 60km of North Goulburn and 35km from Oxley Island.

**Adequacy of Survey**

Systematic surveys and brief searches on other islands in the region (coastal Arnhem Land) found the species on Templar and Valencia Islands in 2009 but did not detect it elsewhere (Mahney *et al* 2010).

**Relevant Biology/Ecology**

The generation length of *Cryptoblepharus gurrmul* is not known. Other small related species mature at one to two years of age and can live up to four to five years (Heatwole & Taylor 1987). Therefore, the generation length is probably in the order of two to three years.

This agile and fast moving terrestrial species is locally common in littoral habitats, including beach sands, rocks and coral rubble, on the five islands. The species forages amongst rocks, coral litter and driftwood in the intertidal zone, retreating to fringing vegetation when confronted by an incoming tide. It feeds on both terrestrial and small marine invertebrates such as amphipods and polychaete worms.

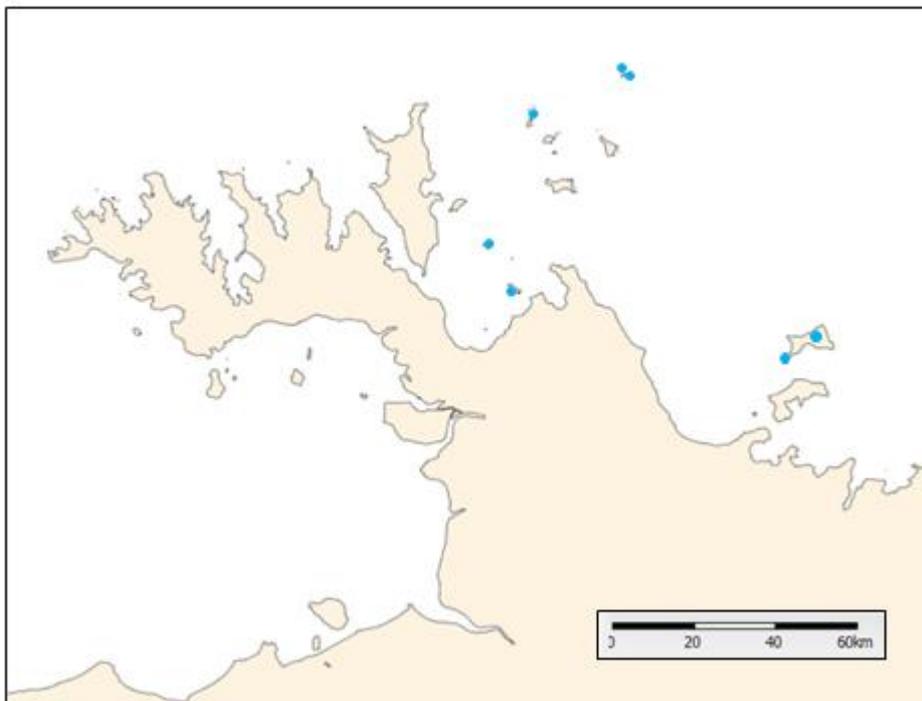
Some individuals, when trapped on rocks, surrounded by water, will escape by swimming rapidly to a nearby rock or shore.

### Threats

Lack of ecological information makes threat assessment difficult. Restriction to five small islands presents a substantial risk. The coastline habitat of these islands is exposed to periodic storm surges associated with cyclones (which may purge much of the terrestrial biota), which may occur more frequently and with greater intensity under future climate change. The islands will reduce in size with any rise in sea level: the highest points on Oxley and New Year Islands are about 12 m above sea level, but most of the islands' areas are <5 m above sea level.

The majority of land on the islands is less than 5 m above sea level. Across the total 83 km of coastline from the 5 islands where the species is known to occur, 51% is beach and 47 % is rocky (based on Smartline Maps [www.ozcoasts.gov.au/coastal/smartline.jsp](http://www.ozcoasts.gov.au/coastal/smartline.jsp) and Google Earth (Smartline does not classify coastline of New Year Island); accessed March 2017). 63% of the coastline is backed by sand. These factors make the species' habitat prone to both inundation and erosion of beach habitat that supports the rock and coral rubble substrates used by these skinks.

The species is known from only five islands and the probability of genetic exchange between these islands is low, so these are considered separate subpopulations. However, all five locations are susceptible to the same threats and single cyclone events could impact on the whole population.



**Assessment of available information in relation to the listing Criteria**

<b>Criterion A. Population size reduction (reduction in total numbers)</b>			
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	<b>Critically Endangered Very severe reduction</b>	<b>Endangered Severe reduction</b>	<b>Vulnerable Substantial reduction</b>
<b>A1</b>	≥ 90%	≥ 70%	≥ 50%
<b>A2, A3, A4</b>	≥ 80%	≥ 50%	≥ 30%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 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.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>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.</p>	<p><i>based on any of the followin</i></p> <p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>		

**Evidence:**

There are insufficient data on any population size and change to assess the species against this criterion.

<b>Criterion B. Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy</b>			
	<b>Critically Endangered Very restricted</b>	<b>Endangered Restricted</b>	<b>Vulnerable Limited</b>
B1. Extent of occurrence (EOO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
AND at least 2 of the following 3 conditions indicating distribution is precarious for survival:			
(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			

**Evidence:**

*Cryptoblepharus gurrumul* is restricted to five islands: North Goulburn Island (39 km<sup>2</sup>), and four small (about 2 km<sup>2</sup>) islands, New Year, Oxley, Templar and Valencia northeast of Croker Island, Northern Territory. Their distribution is highly fragmented: New Year and Oxley islands lie approximately 20 km apart and their distance to the larger North Goulburn Island is about 75km, Valencia and Templar have 10km between them and lie approx 60km from North Goulburn and 35km from Oxley Island. Systematic surveys and brief searches on other islands in this area

have failed to detect this species (Mahney *et al* 2010). The Templar and Valencia Island populations were only discovered in 2009 (Mahney *et al* 2010).

The extent of occurrence of species is approximately 3060 km<sup>2</sup>, and the combined area of the five islands on which it occurs (DIPE 2006) provides an area occupied by the species of less than 47 km<sup>2</sup> (AOO=84 km<sup>2</sup> based on 2x2 km grid technique).

Lack of ecological information makes threat assessment difficult. Restriction to five small islands presents a substantial risk. The coastline habitat of these islands may be exposed to periodic storm surges associated with cyclones (which may purge much of the terrestrial biota), which may occur more frequently and to a greater extent under future climate change. The islands will reduce in size with any rise in sea level: the highest points on Oxley, Templar and New Year Islands are about 15 m above sea level, but most of the islands' areas are <5 m above sea level and the habitat of this species is predominately in the littoral zone.

Based on the above evidence, *Cryptoblepharus gurrmul* is eligible for listing as Endangered (B1+2ab(i,ii,iii,iv,v)) due to its restricted EOO and AOO, severe fragmentation of range, found at five locations, and projected decline in EOO, AOO, extent and area of habitat, number locations, and number of mature individuals associated with sea level rise.

<b>Criterion C. Population size and decline</b>			
	<b>Critically Endangered Very low</b>	<b>Endangered Low</b>	<b>Vulnerable Limited</b>
Estimated number of mature individuals	<b>&lt; 250</b>	<b>&lt; 2,500</b>	<b>&lt; 10,000</b>
AND either (C1) or (C2) is true			
C1 An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	<b>Very high rate 25% in 3 years or 1 generation (whichever is longer)</b>	<b>High rate 20% in 5 years or 2 generation (whichever is longer)</b>	<b>Substantial rate 10% in 10 years or 3 generations (whichever is longer)</b>
C2 An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a) (i) Number of mature individuals in each subpopulation	<b>≤ 50</b>	<b>≤ 250</b>	<b>≤ 1,000</b>
(a) (ii) % of mature individuals in one subpopulation =	<b>90 – 100%</b>	<b>95 – 100%</b>	<b>100%</b>
(b) Extreme fluctuations in the number of mature individuals			

**Evidence:**

There are insufficient data on population size and change to assess the species against this criterion.

Criterion D. Number of mature individuals			
	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
D. Number of mature individuals	< 50	< 250	< 1,000
D2. <i>Only applies to the VU category</i> Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time.	-	-	D2. Typically: AOO < 20 km <sup>2</sup> or number of locations ≤ 5

**Evidence:**

There are insufficient data on population size and change to assess the species against this criterion.

Criterion E. Quantitative Analysis			
	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

**Evidence:**

No such analyses have been done for this species.

**Summary**

*Cryptoblepharus gurrmul* is eligible for listing as Endangered (B1+2ab(i,ii,iii,iv,v)) due to its restricted EOO (3060 km<sup>2</sup>) and AOO (84 km<sup>2</sup>), severe fragmentation of range and found at 5 locations, and the projected decline in EOO, AOO, extent and area of habitat, number of locations, and number of mature individuals associated with sea level rise.

**Conservation Actions**

**Conservation and Management Priorities**

Management priorities are to:

- i. reduce the possibility of introduction of any new predators to these islands; through implementation of the [Threat abatement plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 hectares](#); and through raising public awareness in coastal Arnhem Land of the need for island quarantine when moving between islands;
- ii. evaluate the potential impact of climate change and sea-level rise on the species; through surveys of habitat use and habitat availability and modelling of habitat change through sea-level rise; and
- iii. consider spreading the risk of extinction by translocation of some individuals to other suitable islands or nearby mainland. Any such translocation would need a detailed translocation plan that considered all risks to source and introduced populations and to other species at the proposed location.

### **Survey and Monitoring Priorities**

Areas that are a priority for further surveys for this species are South Goulburn Island and the coastal areas of the mainland adjacent to the islands. Indigenous Ranger groups should be involved in such surveys. NB separation of this species from similar species in the same genus can be difficult, so the taking of specimens or the presence of an herpetologist is required.

Recent surveys to this island group (2009/10) did not include New Year Island. Records of this species from New Year Island are from 1982 and 1979. Surveys to confirm the presence of this species on New Year Island is a priority for this species. Given that the islands are very remote and difficult to get to, further survey and monitoring work should be undertaken with other activities.

### **Information and Research priorities**

The primary research priority is to better evaluate the species' population size and ecological requirements. The former is best done by estimating population density within smaller areas and scaling density up to the area considered to be occupied on each island. The initial ecological factors for which data are needed include diet, shelter requirements, breeding frequency and seasonality.

### **References cited in the advice**

Department of Land Resource Management, (2012). Threatened Species of the Northern Territory: ARAFURA SNAKE-EYED SKINK *Cryptoblepharus gurrmul*. [Online]. Darwin: Department of Natural Resources, Environment and the Arts. Available from: [http://www.lrm.nt.gov.au/\\_data/assets/pdf\\_file/0019/10873/Arafura\\_Snakeeyed-Skink\\_EN\\_FINAL.pdf](http://www.lrm.nt.gov.au/_data/assets/pdf_file/0019/10873/Arafura_Snakeeyed-Skink_EN_FINAL.pdf)

Heatwole, H & Taylor, JA (1987), Ecology of reptiles, 2nd ed., Surrey Beatty & Sons, Chipping Norton, NSW.

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Wilson, S & Swan, G. 2010. A Complete Guide to Reptiles of Australia, 3rd edition. New Holland Publishers (Australia)