

Department of Agriculture, Water and the Environment  
GPO Box 858  
Canberra ACT

Friday, 19 November 2021

**RE: Proposed amendments to the Appendices of CITES for Australian Native Reptiles**

We welcome the opportunity to provide feedback to The Department of Agriculture, Water and the Environment (hereafter referred to as “the Department”) on their **‘Proposed amendments to the Appendices of CITES for Australian Native Reptiles’**. We are a group of scientific researchers actively investigating the domestic and international trade of Australian fauna, with a specific focus on native reptiles. The feedback we have provided is our professional opinion in light of empirical scientific evidence examined by us and other independent scientists. We present our feedback in four main topics, outlined and detailed below.

Overall, we agree with the essence of the Department’s proposal that certain at-risk Australian native reptiles should have international protection under CITES to reduce the risks of poaching, smuggling, and extinction. **(1)** Specifically, it is our interpretation that the proposed taxa are eligible for CITES Appendix III and would benefit from this level of protection. **(2)** Our work and the work of other independent scientific researchers has provided empirical evidence that native Australian reptiles are poached from the wild and smuggled across the border to be sold in overseas exotic pet markets. Here, we detailed the scientific evidence for this risk, including published and unpublished data from overseas markets and data on seizures of native reptiles collected by various Australian government agencies. **(3)** At the same time, we believe that there are additional at-risk reptile taxa not identified by the Department that would similarly benefit from an Appendix III listing. We recommend the Department be more comprehensive in their action against the illegal wildlife trade by listing other endemic reptile taxa that face near-identical risks to the proposed taxa. We provide a list of taxa (21 genera) that are experiencing similar threats (poaching, smuggling, present in overseas trade) and evidence for those risks. **(4)** Also, we highlight three other areas that we believe the Department should be aware of and consider.

The first concern is that the proposal does not address changes in taxonomy that may occur in the future. The second concern is that, historical evidence suggests that any taxa which are newly added to a CITES Appendix face a transitory increased risk of poaching from smugglers who seek to move individuals before the taxa is officially listed. Consequently, we strongly recommend that these CITES listings are accompanied by a temporary increase in poaching and border-smuggling interception efforts. The third consideration centers around how Appendix III can be used as a mechanism to collect data on the illegal trade of Australian reptiles. This data can be analyzed to consider future potential up-listings to Appendix II or I for eligible taxa. We now detail each of the above-mentioned topics in greater detail.

### *1. Appropriate use of CITES and appropriate implementation by the Department*

First, we concur that listing the proposed taxa to Appendix III of CITES is an appropriate course of action given the risks they are encountering. According to CITES 'Implementation of the Convention for Species in Appendix III' [1], it is recommended that a country ensures that the following set of criteria are met before listing a species in CITES Appendix III: (i) the species is native to the country that is listing it (noting that this is especially appropriate for endemic species), (ii) the native country has both the national regulations and enforcement measures to restrict exploitation (i.e., wild harvest) and control trade, and (iii) cooperation from other Parties (i.e., CITES signatory nations) is necessary to monitor and control trade, beyond the national measures already in place.

It is our interpretation that all of the taxa proposed for Appendix III by the Department meet these criteria. First, all the proposed taxa are endemic to Australia, thus satisfying the first criteria. Second, the export of live individuals of all native Australian species for commercial purposes is prohibited under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999) [2]. Further, Australia enforces this law at the border and ports of entry, thus satisfying the second criteria. Last, there is empirical evidence that the proposed taxa are smuggled and traded in overseas markets, such as in Europe (references herein; see Section 2). Once these taxa are smuggled out of Australia, they face little to no restrictions on their trade in recipient countries [3]. For this reason, we argue that listing these taxa to Appendix III will provide a much needed mechanism for other Parties to document and control the trade of the proposed taxa, thus satisfying criteria three.

Additionally, in this response, we recommend other taxa for the Department to consider for Appendix III (see Section 3). Each of our recommended taxa meet the same criteria for Appendix III as the proposed taxa, for the same reasons mentioned above.

## 2. Evidence that proposed taxa are at risk

We independently examined the proposed list of taxa provided by the Department to determine if the taxa are at risk from being poached and smuggled for the international pet trade. We used three criteria from various data sources to determine if a taxon is at risk.

These criteria include:

Criteria 1: If the proposed taxon was seized by government officials within Australia or at the Australian border during export attempts.

Criteria 2: If the proposed taxon was traded in overseas marketplaces, including if the taxon was imported to the United States, a country for which extremely detailed wildlife import records are kept.

Criteria 3: If the proposed taxon is traded in the domestic Australian reptile trade.

Criteria 1 is a clear indication that the taxon faces poaching and smuggling threats as evidenced by a smuggler explicitly trying to move the taxon outside of Australia. Criteria 2 is a clear indication that an overseas trader successfully received a smuggled taxon and is attempting to trade it outside of Australia (see caveat in Section 2.1 about captive breeding of taxon prior to Australian export ban). Criteria 3 suggests that the taxon is desirable and suitable as a pet. While this does not necessarily translate to illegal international trade, we argue this criteria suggests that the taxon might be desirable internationally and is therefore at increased risk of smuggling. Since Criteria 3 is 'weaker' evidence compared to Criteria 1 and 2, we suggest this criteria be considered as less important than, but complementary to, the first two criteria.

We used the following data sources to evaluate if the proposed taxa met the above-mentioned criteria:

- a. Wildlife seizure records collected by the Department of Biodiversity, Conservation and Attractions (DBCA) in Western Australia from 2010 to 2020. These records are from wildlife seizures of postal packages or from home raids. This data is unpublished as was supplied to us by DBCA in 2020.
- b. Federal wildlife seizures records collected by the Department (DAWE) from 2009 to 2018. These records contain wildlife seizures at airports, ports of exit, and from postal parcels intercepted by the government because they contained wildlife and were destined to be delivered outside of Australia. This data is unpublished and was supplied to us by DAWE in 2019.
- c. Marshall et al. 2020 [4], a peer-reviewed research paper examining the online trade of reptiles across many international e-commerce marketplaces.

- d. Altherr & Latemer 2020 [5], a peer-reviewed research paper examining the European trade of reptiles species formally described by science after 2008, including Australian species.
- e. Altherr et al. 2019 [6], a study published by the non-government organization TRAFFIC. This study examines the trade of endemic Australian species on European online marketplaces.
- f. Heinrich et al. 2021 [3], a peer-reviewed research paper examining the international illegal trade of the shingleback lizard (*Tiliqua rugosa*).
- g. United States (US) import/export records maintained by the US Fish & Wildlife Services. This database is called the Law Enforcement Management Information System (LEMIS). Publicly available LEMIS data is available from 1999 to 2014 [7]. In addition, we submitted Freedom of Information Act requests to the US government and received LEMIS data from 1999 to 2018.
- h. We are currently monitoring domestic Australian pet markets. Our methods for choosing websites to monitor and collect data from follow established scientific methods [8]. We search this database for evidence of Australian species traded domestically. This data is unpublished.

The results of our evaluation can be found in **Table 1**. In summary, **all of the taxa proposed by the Department have records of being seized, smuggled, or traded in overseas markets**. Thus, we agree with and confirm that each of the proposed taxa are at risk of exploitation from the international wildlife trade. We note that the genus *Orraya* does not have records of being seized, smuggled, or traded in overseas markets, however, it is extremely similar in appearance to *Saltuarius spp.* so as to warrant a CITES Appendix III listing to avoid species laundering.

### 2.1 Caveat on species traded before the Australian export ban

There has been a ban on the exportation of live Australian reptiles since 1982 under the Wildlife Protection (Regulation of Exports and Imports) Act 1982 [9], which is currently enforced under the EPBC Act 1999 [2]. Prior to 1982, some Australian reptile taxa were legally traded internationally, and, for some species, domestic breeding programs were successfully established internationally (e.g., *Pogona spp.*) [10]. For our response, we have chosen to only focus on modern-day threats. Thus, if we found evidence of poaching, smuggling, or illegal trade, we have chosen to recommend the taxa for Appendix III regardless if it has been historically captive bred.

### 3. Other taxa to consider for Appendix III

While the Department is proposing to list 13 genera representing around 120 species, it is our professional opinion that there are other native reptile taxa which are *not* currently being considered but face the same risks. To assess which additional taxa may be at risk, we performed the same evaluation done for the proposed taxa in Section 2 to other endemic reptile taxa not currently proposed by the Department. The results of this evaluation can be found in **Table 2**.

In summary, we identified 16 genera with records of being illegally poached and seized in Australia or at the Australian border (Criteria 1). Further, we identified 5 additional genera that did not meet Criteria 1, but were found traded in international exotic pet markets (Criteria 2). Finally, we identified 1 genus that only met Criteria 3 (in domestic Australian markets).

**Thus, we recommend the Department consider an additional 21 genera** (that meet Criteria 1 or 2 of Section 2) **for CITES Appendix III**. These genera meet the same risk criteria (or greater in some instances) as the genera proposed by the Department and thus should also be considered for Appendix III. The 21 genera we recommend are as followed: *Acanthophis*, *Notechis*, *Pseudechis*, *Pseudonaja*, *Bellatorias*, *Cyclodomorphus*, *Eremiascincus* (Australian taxa only), *Chelosania*, *Diporiphora*, *Gowidon*, *Lophognathus*, *Lophosaurus* (Australian taxa only), *Moloch*, *Rankinia*, *Christinus*, *Diplodactylus*, *Gehyra*, *Heteronotia*, *Lucasium*, *Nebulifera*, and *Oedura*. We note that one genus only met Criteria 3 (*Amphibolurus*). If the Department would like to take a more aggressive approach to protecting Australian reptiles, we recommend they also consider *Amphibolurus* for Appendix III.

#### 4. Other considerations for the Department

##### 4.1 Taxonomy considerations

We agree with the Department's approach of including whole genera as candidates for Appendix III of CITES and caution the Department to be prepared for taxonomic changes that may arise. Our interpretation of the rationale behind listing genera instead of species is to protect species that are visually similar and account for taxonomic uncertainty. For instance, many species in the genus *Saltuarius* look near-identical even to the trained professional [11], e.g., being distinguishable only by the characteristics of throat scales. Or, as another example, the genus *Acanthophis* (which we recommend for Appendix III listing) has poorly resolved taxonomy and some species differ only by subtle differences in banding pattern and scale keel size. Overall, if only the most at-risk species of a genus was listed to Appendix III and not the entire genus, smugglers could try to pass off the at-risk species with a lesser at-risk species because of their identical appearance. Listing an entire genus eliminates this issue.

In terms of taxonomy, the taxonomic resolution of native Australian reptiles is ongoing and almost certain to change over time. Specifically, there have been around 11 new Australian native squamate species (order Squamata: lizards and snakes) described per year, for the last 10 years [12]. If the Department were to list only species and not genera, then these newly described species would not be protected (if they happen to be classified in one of the proposed genera). Further, scientific work that seeks to better resolve taxonomic differences using DNA frequently reveals that certain species may be in a different genus or maybe even in their own genus [13]. We caution that, for these instances, the Department will want a protocol to swiftly add species to Appendix III that move outside of a protected genus and into a new genus or genus without protection.

#### 4.2 Potential transient increase in smuggling of identified taxa

A key consideration we wish to bring to the attention of the Department is the possibility that proposing/listing new taxa to a CITES Appendix can increase the smuggling activities for those taxa. Previous examples where a taxon has been listed or up-listed in CITES show a temporary but rapid increase in legal/unenforced trade between the initial proposal and implementation of new regulation [14]. While this is typically followed by a long term decrease in trade, in extreme cases, this temporary increase in trade can deplete wild populations and increase market value due to the effect of poaching on perceived rarity [15]. Moreover, due to the dynamic nature of consumer demand for wildlife, a ban in one suite of taxa may stimulate a shift in poaching/smuggling of similar yet unprotected taxa (e.g., the shift from European to tropical eels [16]).

While these potentially adverse effects are important considerations when proposing taxa to be listed in a CITES appendix, we emphasise that Appendix III remains a viable and valuable tool to curtail the illegal international trade of endemic reptiles [3]. We also emphasise that the proposal by the Department to list currently unprotected species on Appendix III rather than directly to Appendix I or II (i.e. a gradual increase in international regulation rather than a sudden increase) is likely to mitigate the aforementioned adverse effects [15]. However, we strongly recommend that the Department, in collaboration with State/Territory governments, temporarily increase their resource allocation to prevent and/or intercept any additional illegal activity that may occur between the initial proposal and implementation of this CITES Appendix III listing.

#### 4.3 Long term potential for increased CITES protection

As discussed in Section 4.2, when species not listed in CITES are proposed for Appendix I or II listings, there are potential adverse effects on rates of trade prior to implementation of new regulations. Yet, it is possible that some endemic Australian reptiles listed in the proposal by

the Department are either (i) threatened with extinction due to trade, or (ii) at risk of becoming threatened with extinction due to trade if it is not regulated in the near-future. As such, some species may benefit from an Appendix I or II listing, yet we currently lack sufficient data to determine the volume of international trade, as well as the proportion of trade that originates from wild-caught populations. An Appendix III listing would provide a mechanism by which international trade can be intercepted and formally documented, allowing the Department to analyse trade dynamics and make informed long-term decisions on whether Appendix I or II listings would be necessary to prevent the threat of extinction to endemic reptiles.

## Summary

In summary, we provide independent verification that the 13 proposed genera by the Department should be listed to Appendix III of CITES. Further, we recommend the Department consider an additional 21 genera, that face identical threats to the proposed genera, for Appendix III.

## References

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## Authors

We are grateful for the opportunity to provide our comments to the Department of Agriculture, Water and the Environment on their '**Proposed amendments to the Appendices of CITES for Australian Native Reptiles**'. This submission was prepared by Dr Oliver Stringham, Mr Sebastian Chekunov, Mr Adam Toomes, Associate Professor Phill Cassey, and Dr Sarah Heinrich.

Dr. Oliver Stringham is a postdoctoral research associate at the University of Adelaide. He specialises in the biosecurity and conservation risks of the exotic pet trade. His research explores the Internet as a conduit for wildlife trade and is developing automated technology to track illegal wildlife trade occurring online.

Sebastian Chekunov is a PhD student at the University of Adelaide, conducting research under the Australian Research Council Grant 'Drivers of the live pet trade in Australian reptiles'. His project investigates the trade of endemic Australian herpetofauna as exotic pets in international markets, exploring the impacts of trade and identifying species most at risk.

Adam Toomes is a PhD candidate in the Invasion Science and Wildlife Ecology group, within the School of Biological Sciences at the University of Adelaide. Adam investigates Australian



seizures and online trade of non-native vertebrates in order to identify emergent trends relevant to biosecurity threats via invasive species.

Associate Professor Phill Cassey is Head of the University of Adelaide’s Department of Ecology & Evolutionary Biology. He has twenty years’ experience with invasive alien species and vertebrate pest management research, and has published over 200 scientific papers on the topic. He is a lead author on the IPBES (Intergovernmental Science Policy Platform on Biodiversity & Ecosystem Services) thematic assessment of invasive alien species and their control. Phill currently leads the Centre for Invasive Species Solutions project ‘Understanding and intervening in illegal trade in non-native species’ and the Australian Research Council Grant ‘Drivers of the live pet trade in Australian reptiles’.

Dr. Sarah Heinrich is an independent conservation scientist and visiting research fellow at the University of Adelaide. Her research focuses on the international wildlife trade and implications for species conservation.

## Tables

**Table 1.** Proposed taxa and evidence they are: poached from the wild and smuggled out of the country (seized by government), traded in overseas marketplaces, and/or traded in domestic Australian marketplaces. Note, the letters listed for each Criteria (a, b, c, etc.) refer to the data sources defined in Section 2.

Proposed taxon	Common name	Evidence of risk		
		Criteria 1 Wildlife seizures	Criteria 2 Overseas markets	Criteria 3 Domestic markets
<i>Tiliqua spp.</i> (Australian taxa only)	Bluetongue lizards/skinks	a, b	c, e, f, g	h
<i>Egernia spp.</i>	Egernia skinks	a, b	c, d, e, g	h
<i>Ctenophorus spp.</i>	Comb-bearing dragons	a	c	h
<i>Intellagama spp.</i>	Water dragons	a	c, g	h
<i>Tympanocryptis spp.</i>	Earless dragons		c, e, g	
<i>Carphodactylus spp.</i>	Chameleon geckos		c, e, g	h
<i>Nephrurus spp.</i>	Knob-tailed geckos	a, b	c, e, g	h

<i>Orraya spp.*</i>	Leaf-tailed geckos			
<i>Phyllurus spp.</i>	Broad-tailed geckos		c, e, g	
<i>Saltuarius spp.</i>	Leaf-tailed geckos		c, d, e, g	h
<i>Strophurus spp.</i>	Spiny-tailed geckos	a, b	c, e, g	h
<i>Underwoodisaurus spp.</i>	Barking geckos	a	c, e, g	h
<i>Uvidicolus spp.</i>	Thick-tailed geckos		e	

\* We note that the genus *Orraya* does not meet any of the criteria, however, it is extremely visibly similar to species in *Saltuarius*.

**Table 2.** Additional taxa under threat from the illegal wildlife trade that we recommend be considered for CITES Appendix III protection. Note, the letters listed for each Criteria (a, b, c, etc.) refer to the data sources defined in Section 2.

Taxon	Common name	Evidence of risk		
		Criteria 1 Wildlife seizures	Criteria 2 Overseas markets	Criteria 3 Domestic markets
<b><i>Elapidae (elapid snakes)</i></b>				
<i>Acanthophis spp.</i> (Australian taxa only)	Death adders	a	d	h
<i>Notechis spp.</i>	Tiger snakes	a	g	h
<i>Pseudechis spp.</i> (Australian taxa only)	Black snakes	a	c	h
<i>Pseudonaja spp.</i>	Brown snakes	a	g	h
<b><i>Scincidae (skinks)</i></b>				
<i>Bellatorias spp.</i>	Major skink, land mullet, and allies	b		h
<i>Cyclodomorphus spp.</i>	Pink- and blue-tongued skinks	a, b	c, e	h

<i>Eremiascincus spp.</i> (Australian taxa only)	Bar-lipped skinks, narrow-banded skinks, and allies	a		h
<b><i>Agamidae (dragons)</i></b>				
<i>Amphibolurus spp.*</i>	Tree dragons and allies			h
<i>Chelosania spp.</i>	Chameleon dragon		c	
<i>Diporiphora spp.</i> (Australian taxa only)	Two-lined dragons and allies	a		h
<i>Gowidon spp.</i> (Australian taxa only)	Long-nosed dragon	a	g	h
<i>Lophognathus spp.</i>	Ta-ta dragon	a	g	h
<i>Lophosaurus spp.</i> (Australian taxa only)	Rainforest dragons		c, e, g	
<i>Moloch spp.</i>	Thorny devil	a, b	c	
<i>Rankinia spp.</i>	Mountain heath dragon		c	h
<b><i>Gekkonidae, Diplodactylidae (geckos)</i></b>				
<i>Christinus spp.</i>	Marbled geckos		c, e	h
<i>Diplodactylus spp.</i>	Stone geckos	a, b	c, e, g	h
<i>Gehyra spp.</i>	Dtella geckos	a	c, e	
<i>Heteronotia spp.</i>	Prickly geckos	a	c, e, g	h
<i>Lucasium spp.</i>	Ground geckos	a	c, e, g	h
<i>Nebulifera spp.</i>	Robust velvet gecko		e, g	h
<i>Oedura spp.</i>	Velvet geckos	a, b	c, d, e, g	h

\* We note that *Amphibolurus* is the only genus in Table 2 that does not meet Criteria 1 or 2.