

Review of *Lygodactylus williamsi*

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1. Introduction

Concern has been raised over the conservation status of *Lygodacylus williamsi*, a small gecko endemic to the United Republic of Tanzania (hereafter referred to as Tanzania), and its trade into the European Union. The EU Wildlife Trade Regulations contain provisions to list in Annex B any species “which is subject to levels of international trade that might not be compatible: with its survival or with the survival of populations in certain countries, or with the maintenance of the total population at a level consistent with the role of the species in the ecosystems in which it occurs” (Article 3.2(c) i) of Regulation (EC) No 338/97). To monitor trade and address this potential threat, the species has been suggested for inclusion in Annex B of the EU Wildlife Trade Regulations.

At COM 64 (13/09/2013), the Chair of the SRG informed the Committee of the support of the SRG for the listing (COM64 SoC). Factors supporting the listing included:

- i) the categorization of the species as Critically Endangered status by the IUCN;
- ii) the lack of information about protection measures in Tanzania; and
- iii) the EU being the main market for the species (COM64 SoC).

This report investigates whether *L. williamsi* is currently offered for sale within the EU, quantities traded, the status and distribution of the population in Tanzania, threats, and legislation or management measures in place, to support the discussion on whether this species might merit listing in Annex B of Regulation (EC) No 338/97, under Article 3.2(c).

2. Assessment of trade in *Lygodactylus williamsi* within the European Union

Methods

In the absence of trade statistics, an internet survey was conducted between the 26th September and the 10th of October 2013, in order to investigate whether *L. williamsi*¹ is being traded into and within the EU, and to assess the demand for this species. First, a list of pet retailers, classified websites, fora or online marketplaces offering reptiles for sale within a variety of EU countries was compiled (Annex I) and each website was checked for advertisements relating to *L. williamsi*, using the scientific name as well as local names of the species. Second, Google searches were conducted in a number of EU languages (Danish, Dutch, English, Estonian, Finnish, French, German, Hungarian, Italian, Portuguese, Spanish and Swedish), using search terms such as 'for sale', 'buy', 'pets', 'price' and 'wanted' for all languages, as appropriate, as well as the species' scientific and local common names.

For each result, the price and source (e.g. wild-sourced or captive-bred) were noted if available, in addition to recording whether the advertisement used the species' scientific or common name. To make the prices comparable, they were converted into Euros (EUR) using the XE Currency Converter (available at <http://www.xe.com/currencyconverter/>).

Any other indications that this species was being kept as a pet, or that there was demand for it as a pet, were also noted.

Trade patterns

L. williamsi was considered to be popular in the pet market due to its bright and striking colouration, diurnal habits and small size (RepLife, 2013; Maisch, 2013). Flecks *et al.* (2012a) reported a rapid increase in the demand of especially male *L. williamsi* in the European and US market since 2004, and van Leeuwen (2009) considered the species to have become increasingly common in trade since 2007.

Flecks *et al.* (2012a) reported that a total of 32 310-42 610 individuals of *L. williamsi* were collected for international trade between December 2004 and July 2009, based on interviews conducted in 2009 among members of the local environmental committee and collectors of *L. williamsi* in the Kimboza and Ruvu Forest Reserves in Tanzania. As only one group of collectors was included in the study, the actual numbers were believed likely to be higher (Flecks *et al.*, 2012a). Weinsheimer and Flecks (2010) reported that based on an interview with a reptile importer, 1000 individuals of *L. williamsi* were exported to Germany each month in 2009.

The specimens in trade were believed to be almost exclusively wild-caught, according to Weinsheimer *et al.* (2010), although discussions on Spanish reptile fora indicated that captive-bred males were easier to find for sale, whereas females were more difficult to find and typically wild-caught. In Italy, the price of wild-caught males was significantly lower (EUR 100) than that of captive-bred females (EUR 180). Maisch (2013) noted that wild-caught individuals were generally much cheaper than captive-bred individuals, and this was confirmed in discussions on Portuguese websites.

Prices paid for the species varied over time, and Weinsheimer and Flecks (2010) noted that the price paid for an individual *L. williamsi* declined from over USD 1500 (ca. EUR 1110) to USD 40 (ca. EUR 30) as the species became more common in trade. *L. williamsi* was recommended particularly for people new to keeping reptiles, as the species was considered easy to keep and feed, and attractive visually and financially (Peter, 2011). Table 1 provides an overview of the market and demand for the species in EU countries.

Table 1: Overview of the market and demand in various EU countries

Country	Notes	Interest expressed	Sources offered	Prices per individual
Austria	At least 11 "Himmelblauer Zwergtaggecko" were offered for sale on online marketplaces and fora, (advertisements posted 25/9/2012-3/10/2013). At least ten people expressed interest in acquiring the species on forum discussions.	Yes	Not specified	EUR 80-99
Belgium	At least two sellers provided "Gecko blue neon/Turquoise dwarf	Yes	W (C)	EUR 69-79

¹ Initial searches showed that *L. williamsi* was commonly offered for sale using both the scientific and the common name.

Country	Notes	Interest expressed	Sources offered	Prices per individual
	gecko/Azure gecko" for sale. One seller specified that captive-bred individuals were difficult to find, and if available, their prices would be considerably higher.			
Denmark	At least five individuals of " <i>Lygodactylus williamsi</i> /Blue gecko" were offered for sale on pet shops and fora. The species was advertised as being "available upon request" from one pet shop, and two other sites were offering several individuals for sale.	Yes	Not specified	EUR 20-117
Estonia	No <i>Lygodactylus</i> spp. were observed for sale.	-	-	-
Finland	No <i>Lygodactylus</i> spp. were observed for sale. However, forum discussions indicated that some hobbyists had purchased the species.	Yes	-	-
France	At least nine individuals of "Gecko blue neon/ <i>Lygodactylus williamsi</i> " were offered for sale. One seller specified that captive-bred individuals were difficult to find.	Yes	W (C)	EUR 60-140
Germany	A total of 161 individuals of "Himmelblauer Zwergtaggecko" were offered for sale on the two main online marketplaces. In addition, at least 19 individuals of " <i>Lygodactylus williamsi</i> /William's dwarf gecko" were offered for sale on pet shop websites and fora. One seller offered several juvenile individuals that were said to be bred from wild-caught parents.	Yes	W, F1	EUR 40-109
Hungary	At least 13 "Tanzániai kék gecko/ <i>Lygodactylus williamsi</i> " were offered for sale on fora, pet shops and online marketplaces. Two males and four females were said to be captive-bred.	-	C	EUR 10-50
Ireland	No <i>Lygodactylus</i> spp. were observed for sale.	-	-	-
Italy	At least five individuals of "Micro blu/Neon uvb/ <i>Lygodactylus williamsi</i> " were offered for sale.	Yes	W, C	EUR 40-180
Luxembourg	No <i>Lygodactylus</i> spp. were observed for sale.	-	-	-
Netherlands	At least 23 individuals of " <i>Lygodactylus williamsi</i> " were offered for sale on pet shop and breeder websites. Four adverts indicated having more than one individual for sale. Four male individuals and 12 juveniles for sale were said to be captive-bred. Inquiries about the availability of female individuals and about terrarium requirements of the species were also posted on fora.	Yes	C	EUR 40-89.50
Portugal	At least one forum and one pet shop offered " <i>Lygodactylus williamsi</i> " for sale, with prices varying between EUR 60 and EUR 90.	-	Not specified	EUR 60-90
Spain	At least 20 specimens of "Gecko diurno azul de Tanzania/Gecko azul enano/ <i>Lygodactylus williamsi</i> ", some of which were said to be wild-caught, were offered for sale on online marketplaces. The Spanish "Expoterraria" fairs, organised in Madrid, Barcelona and Seville, were said to offer wild-caught specimens for sale.	Yes	W, C	EUR 25-80
Sweden	At least seven " <i>Lygodactylus williamsi</i> " were offered for sale on fora and pet shop websites (adverts posted between 05/03/2011-17/09/2013). Some individuals were young (two to eight months old), and some adult specimens were said to be "newly acquired".	-	Not specified	EUR 57-114.5
United Kingdom	At least 30 individuals of " <i>Lygodactylus williamsi</i> /Electric-blue day gecko/Williams blue/Turquoise Dwarf Gecko were offered for sale on pet shop websites, fora and online marketplaces. One pair and one subadult were said to be wild caught. Some individuals offered for sale were nine weeks old, and two juveniles were said to be captive-bred.	Yes	W, C	EUR 59-82

3. Conservation status of *Lygodactylus williamsi*

SPECIES: *Lygodactylus williamsi*

COMMON NAMES: Blå gecko, Elektrisk blå gecko (Danish), Azuurblauwe daggekko (Dutch), Turquoise Dwarf Gecko, William's Dwarf Gecko, Electric Blue Gecko (English), Williaminkääpiögekko, Sinigekko (Finnish), Himmelblauer Zwergtaggekko (German), Tanzániai kék gecko (Hungarian), Gecko diurno azul de Tanzania, Gecko azul enano (Spanish), Blå Daggekko (Swedish)

RANGE STATES: United Republic of Tanzania

RANGE STATE UNDER REVIEW: United Republic of Tanzania

IUCN RED LIST: Critically Endangered

PREVIOUS EC OPINIONS: Species not listed in CITES Appendices/EU Annexes.

CONSERVATION STATUS in range state

Lygodactylus williamsi is a small, diurnal dwarf gecko, which is endemic to a small area in Tanzania (Spawls *et al.*, 2002). The species was reported to inhabit the forests of Kimboza (Spawls *et al.*, 2002; Flecks *et al.*, 2012a; Broadley and Howell, 2000; Burgess *et al.*, 1998; Weinsheimer and Flecks, 2010) and Ruvu (Spawls *et al.*, 2002; Flecks *et al.*, 2012a) at the foothills of the Uluguru mountains in Eastern Tanzania, at altitudes of 170-480 a.s.l. (Flecks *et al.*, 2012a). Flecks *et al.* (2012a) also recorded two small populations at Mbagalala and Muhalama to the north of these forests. The extent of occurrence of *L. williamsii* was estimated to be approximately 20 km² (Flecks *et al.*, 2012b, 2012a), whereas the area of occupancy was estimated to be less than 8 km² (Flecks *et al.*, 2012b). *L. williamsi* is a territorial species that occurs only in association with screw pines *Pandanus rabaiensis* (Weinsheimer and Flecks, 2010), with typically one male, one or more females and several juveniles inhabiting each tree (Flecks *et al.*, 2012a). In captivity, the species was recorded to lay two eggs every 3-4 weeks, with an incubation time between 60-120 days depending on temperature (Maisch, 2013). Surveys conducted in natural habitats by Flecks *et al.* (2012a) indicated that the species was able to reproduce several times in a year and have a relatively high reproductive output.

Bayliss (1994) considered *L. williamsi* to be relatively common in the Kimboza forest and observed several specimens during a field study on the behaviour of the species between February and March 1994. Flecks *et al.* (2012a) conducted visual encounter surveys of *L. williamsi* in the Kimboza and Ruvu Forest Reserves and the surrounding areas between August and October 2009. Based on observations on the mean number of individuals on each *P. rabaiensis* and the distribution and abundance of the plant, the population size of *L. williamsi* in the Kimboza forest was estimated to be 148 684 ± 112 365 adult individuals, with a population density of 353 individuals per ha (Flecks *et al.*, 2012a). The potential population size, based on habitat availability, was estimated to be 234 921 adult individuals (with a density of 557 specimens per ha), and the difference between potential and actual population size was suggested to indicate a strong population decline (Flecks *et al.*, 2012a). Interviews with local inhabitants confirmed the decreasing population trend: it was reported that the species "used to be found in much larger numbers until a few years ago" (Flecks *et al.*, 2012a).

Bayliss (1994) did not observe the species in surveys conducted in the Ruvu South Forest Reserve in 1994, and Flecks *et al.* (2012a) believed this population to be much smaller than that in Kimboza, due to a drier climate resulting in fewer *P. rabaiensis* plants. The populations in Mbagalala and Muhalala were reported to consist of a low number of isolated *P. rabaiensis* trees (Weinsheimer and Flecks, 2010).

L. williamsi was categorized as Critically Endangered in the IUCN Red List due to its limited distribution, fragmented populations, ongoing habitat destruction and collection for the international pet trade (Flecks *et al.*, 2012b). Its population trend was considered to be decreasing (Flecks *et al.*, 2012b).

Flecks *et al.* (2012a) considered over-collection to be the main threat to the species. Its limited distribution and habitat fragmentation were considered to make the species prone to overharvesting (Flecks *et al.*, 2012a; Weinsheimer and Flecks, 2010). Flecks *et al.* (2012a) estimated that at least 15 per cent of the *L. williamsi* population was collected for international trade between December 2004 and July 2009 in Kimboza. Local collectors were reported to keep the specimens until the quantity ordered was reached, after which they were transported to Dar es Salaam; transport mortality was thought to be potentially high, although this could not be verified (Flecks *et al.*, 2012a). Van Leeuwen (2009) noted that especially in the beginning, the mortality of animals during international shipments was very high.

Habitat loss was regarded as another important threat (Flecks *et al.*, 2012a; TRAFFIC, 2011; Weinsheimer and Flecks, 2010), and Flecks *et al.* (2012b, 2012a) noted that the populations in the Kimboza, Ruvu, Muhalama and Mbagalala forests were isolated from each other due to lack of suitable habitat between them. Despite the Kimboza and the Ruvu forests being located within catchment forest reserves, illegal logging, collection of firewood, conversion of forest to agricultural land, and mining were reportedly taking place (Hymas, 2000; Morogoro Catchment Forest Project, 2004), and a lack of financial and technical resources, insufficient number of staff and low expertise were considered to render effective management of the Kimboza forest area difficult (Morogoro Catchment Forest Project, 2004). Flecks *et al.* (2012a) noted that *P. rabaiensis* trees were typically cut down to capture *L. williamsi*, further contributing to habitat degradation.

Unlicensed hunting and capture of wild animals from Forest Reserves is prohibited in Tanzania under the Forest Act of 2002 (Government of Tanzania, 2002). Flecks *et al.* (2012a) reported that according to officials of the Tanzania Wildlife Research Institute, collection and export of the species had never been licensed in the country, and hence all trade from the country could be considered illegal. Tanzania reportedly imposed a temporary ban on all wildlife exports in August 2011 following a significant illegal export of wildlife (BBC, 2011), however, it is unclear how long this ban was in force. Flecks *et al.* (2012a) reported that a workshop was held in cooperation with the Department of Zoology and Wildlife Conservation of the University of Dar es Salaam in 2010 to raise awareness of the status of *L. williamsi* and to train officers to identify the species (Flecks *et al.*, 2012a).

The status of the species in the wild and trade levels observed were believed to make the survival of the species strongly dependant on conservation action (Weinsheimer *et al.*, 2010).

The species was reportedly being bred in captivity in Europe by several hobbyists and considered relatively easy to breed (RepLife, 2013; Maisch, 2013), although van Leeuwen (2009) noted that the structure of the captive populations was skewed, with a very small number of females. A breeding programme was reportedly initiated via the European Studbook Foundation to monitor the genetic diversity and population size of the species in captivity (van Leeuwen, 2009). Coordinated effort to support captive breeding was seen as an important potential means to conserve the species (Flecks *et al.*, 2012a).

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Annex I: Websites accessed to investigate the trade in and demand for *Lygodactylus williamsi* within the European Union.

Website	Country/Region	Type of site
www.tieranzeigen.at	Austria	Online marketplace
www.willhaben.at	Austria	Online marketplace
http://reptilienforum.at	Austria	Forum
http://www.mikesreptipark.be	Belgium	Petshop
http://www.poilsetplumes.be	Belgium	Petshop
http://www.newselfagro.be	Belgium	Petshop
http://rc-reptiles.forumactif.com	Belgium	Forum
www.nhf.dk	Denmark	Forum
www.dba.dk	Denmark	Online marketplace
http://exotiskedyr.dk	Denmark	Petshop
www.minizoo.dk	Denmark	Petshop
www.dyrenes-verden.dk	Denmark	Petshop
www.lemmikloomapood.ee	Estonia	Petshop
www.lemmikule.ee/	Estonia	Petshop
www.herppi.net	Finland	Forum
www.lemmikistore.fi	Finland	Petshop
www.zooplus.fi	Finland	Petshop
http://tiias-pets.net	Finland	Petshop
www.vipeltajat.fi/	Finland	Petshop
http://www.bebesaurus.com	France	Petshop
http://www.exotus.fr	France	Petshop
http://www.animaux.fr/	France	Petshop
http://scales.kazeo.com	France	Petshop
http://reptimagine-cie.fr	France	Breeder
http://phelsuma-france.forum-actif.net/	France	Forum
http://lapassiondesreptiles.forumactif.com/	France	Forum
http://www.aft.asso.fr/	France	Forum
http://kleinanzeigen.ebay.de	Germany	Online marketplace
www.dhd24.com	Germany	Online marketplace
http://aquaterra-shop.de	Germany	Petshop
www.terraon.de	Germany	Forum
www.quoka.de	Germany	Online marketplace
www.geckoz.de	Germany	Forum
www.terra-dom.de	Germany	Petshop
www.reptilien-forum.info	Germany	Forum
www.terraristik.de	Germany	Reptile breeders' site
www.markt.de	Germany	Online marketplace
www.reptilia.hu	Hungary	Forum
http://szekesfehervar.olx.hu	Hungary	Site for advertising
www.expressz.hu	Hungary	Site for advertising
http://aprod.hu	Hungary	Site for advertising
www.petshoponline.ie/	Ireland	Petshop
www.petconnection.ie	Ireland	Petshop
www.petmania.ie	Ireland	Petshop
www.petworlddirect.ie	Ireland	Petshop
www.petworld.ie	Ireland	Petshop
www.pet-bliss.ie	Ireland	Petshop
http://www.soniarettidelmondo.com/sauri.html	Italy	Petshop
http://www.animalsclubgenova.com	Italy	Petshop
http://www.sanguelfreddo.net/forum/php	Italy	Forum
http://www.italiangekko.net/forum/	Italy	Forum

Annex I: Websites accessed

http://special-pet.nl	Netherlands	Petshop
www.marktplaats.nl	Netherlands	Online marketplace
www.guppy.nl	Netherlands	Petshop
http://wellediertotaal.nl	Netherlands	Petshop
www.animals-express.com	Netherlands	Petshop
www.gekkoforum.nl	Netherlands	Forum
http://forum.lacerta.nl	Netherlands	Forum
www.wintergeckos.de/nl	Netherlands	Homepage of a breeder
www.yeldo.nl	Netherlands	Site for advertising
www.lojaselva.com	Portugal	Petshop
http://arcadenoe.sapo.pt/search.php	Portugal	Forum
www.apterrariofilia.org/	Portugal	Forum
www.exzootica.com	Spain	Petshop
www.bichosfera.com	Spain	Petshop
www.harkitoreptile.com	Spain	Petshop
www.reptilmercado.com	Spain	Petshop
http://tienda.mercafauna.com/	Spain	Petshop
www.euroreptiles.com	Spain	Petshop
www.aqualand-scp.com	Spain	Petshop
http://lacuevadeldragon.tripod.com	Spain	Petshop
http://www.mundotortuga.com	Spain	Petshop
http://www.reptilmadrid.com/coleccion.html	Spain	Breeder
http://www.tritonreptiles.com	Spain	Breeder
www.tropicalmanises.com	Spain	Petshop
www.dragoreptile.com	Spain	Petshop
www.animalcenter.es	Spain	Petshop
http://dnatecosistemas.com/	Spain	Petshop
www.mascotasdelvalle.es	Spain	Petshop
www.directoriomascotas.com.es	Spain	Petshop
www.milanuncios.com	Spain	Forum
http://www.terrariofilia.com	Spain	Forum
http://tuatera.com/foro	Spain	Forum
www.zoozooklart.se	Sweden	Petshop
www.herperschoise.se/	Sweden	Petshop
www.hokarangenzoo.se/	Sweden	Petshop
www.varnamoozoo.se	Sweden	Petshop
www.zooariet.se	Sweden	Petshop
www.tassaromorrhar.se	Sweden	Petshop
www.repti.net	Sweden	Forum
www.terraredjur.se	Sweden	Forum
http://gecko.ifokus.se	Sweden	Forum
http://reptinet.communityisland.com	Sweden	Forum
www.tropikhuset.se	Sweden	Petshop
https://sv-se.facebook.com/VarnamooZoo/timeline	Sweden	Zoo and petshop
www.reptileforums.co.uk	United Kingdom	Forum
www.warringtonpetsandexotics.com	United Kingdom	Petshop
www.preloved.co.uk	United Kingdom	Online marketplace
www.reptiletrader.co.uk	United Kingdom	Online marketplace
www.exotic-pets.co.uk	United Kingdom	Petshop
www.pets4homes.co.uk	United Kingdom	Online marketplace
www.cityreptiles.com	United Kingdom	Petshop
www.captivebredreptileforums.co.uk	United Kingdom	Forum
www.bluelizardreptiles.co.uk	United Kingdom	Petshop