



Short communication

Estimating the global trade in Southeast Asian newts



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ABSTRACT

The global trade in amphibians is widespread, involves hundreds of species, and has been implicated in amphibian population declines. The pet trade is the primary driver for population declines in one Southeast Asian newt species (*Laotriton laoensis*), and is a known threat to most of the 13 other known species from the region. Despite this, there has been little attempt to assess the impact of collection for the pet trade on Southeast Asian newts. We examined available import data from the US, Europe and Hong Kong, assessed current online trade and surveyed local pet traders within Southeast Asia. Large numbers of Southeast Asian newts are harvested from the wild to meet the demands of the international pet trade, with more than 7500 individual newts imported into the US alone during 2005–2014. Internet trade surveys revealed the global extent of the trade, with Southeast Asian newts for sale as pets in 15 countries throughout Europe, Asia and North America, at between ~ USD30–260 each. The trade in newts within Southeast Asia appears negligible in comparison. Urgent measures are required in order to conserve Southeast Asian newts but the lack of data on the species and number of individuals impacted by the pet trade makes it difficult to monitor and accurately assess its threat. We strongly recommend that all Southeast Asian newts be listed on CITES. This measure should improve monitoring of trade and provides importing countries opportunity to curb trade in species that were illegally harvested, thus helping to safeguard wild populations.

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1. Introduction

The international wildlife trade is one of the leading threats to biodiversity conservation. This threat is disproportionately large in Southeast Asia, a region that is both a centre for the consumption of wildlife products and a major supplier of wildlife to the international market (Nijman, 2010; Sodhi et al., 2004; TRAFFIC, 2008). The unsustainable, and often illegal, harvest of animals from the wild in Southeast Asia has already resulted in species population declines and extirpations (Duckworth et al., 2012; Rao et al., 2014; Stuart et al., 2006; van Schingen et al., 2014).

The global trade in amphibian species is widespread, involves hundreds of species, and has been implicated in driving local amphibian population declines (Jennings and Hayes, 1985; Wang et al., 2004). In Southeast Asia, amphibians are harvested from the wild to supply the demand for food, pets, and traditional medicine (Rowley et al., 2010). The pet trade is a major driving force behind the wildlife trade in Southeast Asia (Sodhi et al., 2004) and has been identified as causing population declines in at least one species of amphibian in Southeast Asia, the Lao Newt *Laotriton laoensis* (Phimmachak et al., 2012; Stuart et al., 2006).

Recently, global attention has been drawn to the international trade in Asian newt species as vectors for the introduction of the pathogen *Batrachochytrium salamandrivorans* (Bsal) into Europe (Martel et al., 2014). This pathogen threatens the survival of newts and salamanders native to Europe, and potentially those in North America (Gray et al., 2015; Martel et al., 2014; Yap et al., 2015). A temporary ban on importing Asian newts has been proposed for the sake of native population of European and North American salamanders (Gray et al., 2015,

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Yap et al., 2015). Thus, curbing trade in Asian newts may have the unintended benefit of also protecting wild salamander populations elsewhere in the world (Stuart et al., 2014).

Fourteen species of newt in three genera (*Laotriton*, *Paramesotriton* and *Tylototriton*) have been reported from four countries in Southeast Asia: Laos, Myanmar, Thailand and Vietnam (Frost, 2016; Table 1). Over 70% are endemic to the region (Frost, 2016). Our understanding of newt diversity in the region has changed dramatically in recent years, with the number of species recognised from the region increasing threefold since 2000 (Frost, 2016). This is a result of increased survey effort and the incorporation of molecular data in resolving species boundaries in morphologically conserved taxa (Le et al., 2015; Nishikawa et al., 2013, 2014; Phimmachak et al., 2015a; Stuart et al., 2010). Undescribed diversity likely remains (Nishikawa et al., 2013; Sparreboom, 2014) and the basic biology, ecology and true conservation status of known Southeast Asian newts remains poorly-known (Phimmachak et al., 2015b).

At present, global conservation status assessments are available for only about half of all Southeast Asian newt species (IUCN, 2015), and most others have not been assessed in more than a decade (prior to taxonomic revision). Of the eight assessed species, four are considered threatened with extinction, and three are near threatened (Table 1). *Tylototriton verrucosus* is the only species of newt in Southeast Asia that is currently considered Least Concern, but since the assessment was performed (van Dijk et al., 2009), new research has shown that this species actually consists of a complex of several species, each having narrower ranges and thus more likely to be threatened (e.g., Nishikawa et al., 2013, 2014; Phimmachak et al., 2015a; Le et al., 2015). For example, one recently described species previously thought to be *T. verrucosus*, *T. shanorum*, is endemic to Myanmar (Nishikawa et al., 2014), where it is currently known only from a few ponds at risk of development (G. Wogan, pers. comm).

According to the IUCN (2015), collection for the pet trade is considered a threat to all Southeast Asian newt species except *Paramesotriton guangxiensis* and *Tylototriton vietnamensis* (although both species are in the pet trade and so may also be threatened by trade; Sparreboom, 2014). The pet trade is the primary driver for population declines of *Laotriton laoensis* (IUCN SSC ASG 2014; Phimmachak et al., 2012; Stuart et al., 2006). Despite this, there has been little attempt to assess the impact of the collection for the pet trade on wild Southeast Asian newt populations (but see Anonymous, 2013).

To gain a better understanding of the nature and scale of the trade in Southeast Asian newts, we examined import records from the US, EU and Hong Kong, surveyed global online trade and surveyed local pet traders within Southeast Asia.

2. Methods

We obtained records of shipments of Southeast Asian newts into or out of the United States, from 2005 to 2014 (Yap et al., 2015), and from the USFWS Law Enforcement Management Information System (LEMIS). For import records of Southeast Asian newts into the EU, we downloaded available data from the CITES Trade Database (2011–2013; http://trade.cites.org/en/cites_trade, downloaded April 2016). Species in the genera *Laotriton*, *Paramesotriton* and *Tylototriton* have been listed on Annex D of the European Union Wildlife Trade Regulations since 2009. We also obtained records of newts imported into Hong Kong from November 1998 to June 2015 from the Agriculture, Fisheries and Conservation Department of the Hong Kong Special Administrative Region Government (Appendix 1). We used these data because of their availability; similar data were unavailable for other countries, including those that are likely significant importers of Southeast Asian newts, notably Japan and mainland China.

We conducted an online survey for Asian newts in the pet trade by searching via Google and directly via websites and forums selling amphibians (Appendix 2) using scientific species names and common names in English, Vietnamese, Mandarin, Japanese, German, Dutch and Spanish. Although we attempted to be comprehensive, we likely missed non-English language sites as many sites did not list scientific names in identifying animals for sale, and common names were often not species-specific or reliable. When possible, information on prevalence, origin and cost were gathered from websites.

Vietnam contains the highest species diversity of newts of any of the four Southeast Asian countries. As such, we used Vietnam as a case study to assess the local trade in Southeast Asian newts for both pets and traditional medicine. We investigated local trade in Hanoi and Ho Chi Minh City. In Hanoi we surveyed 25 stores (20 pet/aquarium shops, one free-lance trader, and four traditional medicine stores) on 25 to 26 July 2015. In Ho Chi Minh City we visited 10 stores (seven pet/aquarium shops, and three traditional medicine stores) from 29 November to 5 December 2015.

3. Results

Between 2005 and 2014, 7508 individuals of four species of Southeast Asian newts were recorded as being imported live into the US: *Laotriton laoensis*, *Paramesotriton deloustali*, *Tylototriton shanjing* and *T. verrucosus* (Fig. 1). In addition, 1194 specimens reported only to the genus *Paramesotriton* or *Tylototriton*, and therefore potentially from Southeast Asia, were also reported. The Southeast Asian newt species

Table 1

Southeast Asian (Laos, Myanmar, Thailand and Vietnam) newt diversity, distribution, threats, protected status and detected presence in commercial trade.

Species	Year described	Endemic to SE Asia	Range	Threat Status	Protected status	In trade 2015 (online)*	In trade (LEMIS 2005–2014)**	In trade (EUWTR 2011–2013)
<i>Laotriton laoensis</i>	2002	Yes	Laos	EN	Laos	259 (7)	Yes	Yes
<i>Paramesotriton deloustali</i>	1934	Yes	Vietnam	VU	Vietnam	7(4)	Yes	
<i>Paramesotriton guangxiensis</i>	1983	No	China, Vietnam	EN				
<i>Tylototriton anguliceps</i>	2015	Yes	Laos, Thailand, Vietnam	NA	Thailand pending?			
<i>Tylototriton asperimus</i>	1930	No	China, Vietnam	NT		70 (5)		Yes
<i>Tylototriton notialis</i>	2010	Yes	Laos, Vietnam	VU				
<i>Tylototriton panhai</i>	2013	Yes	Laos, Thailand	NA	Thailand pending?			
<i>Tylototriton podichthys</i>	2015	Yes	Laos	NA				
<i>Tylototriton shanjing</i>	1995	No	China, Thailand	NT		59 (12)		
<i>Tylototriton shanorum</i>	2014	Yes	Myanmar	NA				
<i>Tylototriton uyanoi</i>	2013	Yes	Thailand	NA	Thailand pending?			
<i>Tylototriton verrucosus</i>	1871	No	Bhutan, China, India, Thailand	LC	Thailand	30 (23)	Yes	Yes
<i>Tylototriton vietnamensis</i>	2005	Yes	Vietnam	NT	Vietnam		Yes	Yes
<i>Tylototriton zieglerei</i>	2013	Yes	Vietnam	NA				
<i>Paramesotriton sp.</i>							Yes	
<i>Tylototriton sp.</i>							Yes	

* Average price per individual in USD (and number of records found).

** Source: Table S3, Yap et al. 2015.

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