



A Review of the Declining Status of the Indian Star Tortoise *Geochelone elegans* in India with Special Reference to Rajasthan

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The Indian Star Tortoise (*Geochelone elegans*) occurs in India, Pakistan, and Sri Lanka (D’Cruze et al. 2018; Gaur et al. 2006). In Pakistan, it inhabits the Thar Desert in the extreme southeastern part of the country (D’Cruze et al. 2018); in India, it has a disjunct distribution in Gujarat and Rajasthan in northwestern India (Vyas 2006), a few areas in western Madhya Pradesh (Vyas and Singh 2004), and in Tamil Nadu (Sharath 1997; Johnsingh 2001), Kerala (Jayson 1993), Andhra Pradesh, Telangana, and southern Karnataka (Anand et al. 2005) in southern India (Fig. 1); and it ranges throughout much of especially coastal Sri Lanka (Vyas 2010; de Silva et al. 2017).

The estimated area of occupancy is 2,000 km² and the extent of occurrence is 20,000 km² (Choudhury et al. 2020), with an extensive elevational distribution to 900 m asl in Sri Lanka (D’Cruze et al. 2016). Indian Star Tortoises occur in both dry and seasonally wet situations (Fife 2007; Subramanyam et al. 2006) in a variety of habitats (de Silva 2003) that include moist deciduous forests, arid grasslands, thorn scrub forests, and semi-arid forests (D’Cruze et al. 2018), although arid climatic conditions appear to be most suitable (Anand et al. 2005).

Indian Star Tortoises face threats that include predation, dwindling food resources, and habitat loss throughout the species’ range that are largely attributable to the conversion of scrub-forest habitat to orchards and agricultural land (Das 2002; de Silva 2003; Fife 2007). However, the greatest threat remains illegal collection either for international trade or by local residents, who believe that keeping a Star Tortoise at home will bring good fortune to the household (Vyas 2010; D’Cruze et al. 2018). In many places on the Indian Subcontinent, the Indian Star Tortoise is thought to be a reincarnation of the Hindu God Vishnu, as per Hindu Mythology (D’Cruze et al. 2015).

Estimates of population sizes and declining trends often are based on inadequate data as wildlife censuses in protected areas by Indian forest departments frequently exclude this species; however, Anand (2005) stated that uncontrolled collection of Indian Star Tortoises from the wild pointed to a prospective gradual decline of populations. The global wildlife trade of the species is based mostly in Malaysia, Singapore, Thailand, and other southeastern Asian nations (Shepherd et al. 2004). Because these tortoises often had been abundant in many parts of their range, they were considered to be of Least Concern on the IUCN Red List of Threatened Species as recently as 2016 (D’Cruze et al. 2016). Even then, how-

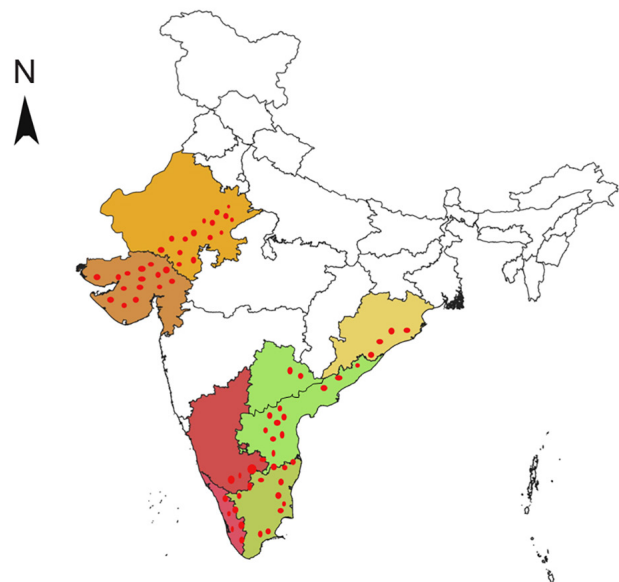


Fig. 1. Map of India showing the distribution of the Indian Star Tortoise (*Geochelone elegans*). Red dots denote recorded populations. Adapted from Kundu et al. (2022) and D’Cruze et al. (2018).

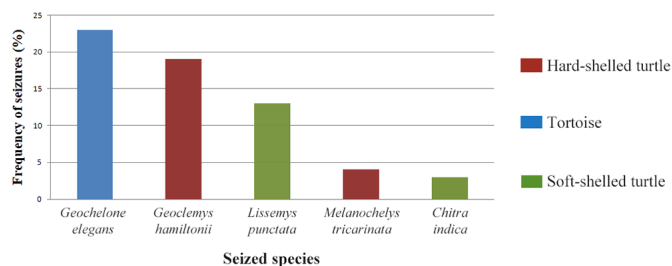


Fig. 2. Percentage representation of seized tortoises and freshwater turtles. Note that the greatest number are Indian Star Tortoises (*Geochelone elegans*). Adapted from Mendiratta (2017).

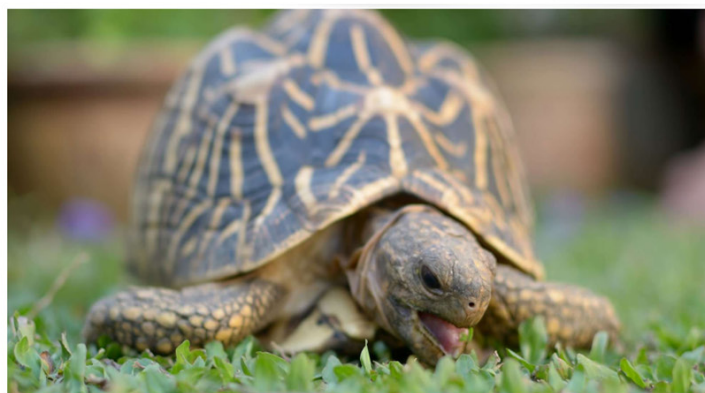
ever, illegal smuggling of the species to markets in Europe, Asia, and America from India had become the largest contributor to population declines in India (de Silva 2003; Vyas 2015). In a study of the illegal trade of Indian tortoises and freshwater turtles (TFT), Mendiratta et al. (2017) found that *G. elegans* was the most frequently collected species based on seizure data (Fig. 2), and Shephard and Nijman (2015) determined that *G. elegans* was the most abundant TRT species in the wildlife trade in Thailand.

Indian Star Tortoises are extremely popular in the international trade, and care sheets (e.g., Fife 2007; Tabaka and Senneke 2006) are readily available. To meet this demand, an estimated 10,000–20,000 tortoises are removed from the wild annually, with the peak collection season corresponding with the monsoon in July and August (Shepherd et al. 2004). An

average of about 3,000 tortoises are rescued from smugglers and local households per year (Fife 2007; Gaur et al. 2006; Sekhar et al. 2004; Subramanyam et al. 2006).

Tortoises are hardy and their ability to survive 10–15 days without food makes them easy to smuggle and thus boosts the trade; nevertheless, diseases like pneumonia and parasitic infestations, often attributable to inhumane conditions to which they are subjected by smugglers and collectors, lead to the deaths of many wild-caught animals (Subramanyam et al. 2006; Fife 2007).

In Rajasthan, information regarding the status of turtles and tortoises, including *G. elegans*, was summarized by Bhupathy and Mathur (2013). Indian Star Tortoises have been reported in Udaipur (Smith 1931), near Jawai Bandh on the western side of the Aravalli Hills (Prakash 1971), and in Jalore (Bhupathy et al. 1994). Because of the suitable habitats in the state, the arid zone of Rajasthan is a major source of tortoises and also has been a substantive component in the illegal wild animal trade (Bhupathy and Mathur 2013). Although collectors often are caught by the Forest Department and other enforcement agencies (Fig. 3), previously the trade continued to flourish due to the limited protection afforded by law (i.e., being under Schedule IV in the Wildlife Protection Act, 1972, which offers a lesser level of protection than the Schedule I species, see below). Moreover, the lack of studies on the distribution and trade of the species in Rajasthan in comparison to the neighboring state of Gujarat is disturbing.



Jaipur Police Arrested A Man Keeping A Wild Animal Tortoise As A Pet

News
 April 18, 2019 • Ayushi • Leave A Comment
 Jaipur police and a team of forest department officials arrested a man on Tuesday for keeping a star tortoise at his house.
 The man brought the tortoise due to his superstition considering it as a solution to his family-related issues and has been keeping the wild animal for the past one and a half years.
 The accused was identified as Vishal Singh is a resident of the Malviya Nagar area in Jaipur.

Fig. 3. Media reports of the Indian Star Tortoise trade and seizures in Rajasthan.

In Gujarat, Vyas (2006) provided detailed information on the distribution of *G. elegans* in the protected areas and zoos of the state and the species was found to be widely distributed in 15 districts and in 11 protected areas. The lack of comparable information for Rajasthan makes it difficult to document declines in populations.

Efforts to conserve wild tortoise populations include the Indian Wildlife Protection Act, 1972, which makes it illegal to possess or trade in Indian Star Tortoises. Most recently, the Indian Wildlife Protection Act amendment 2022 came into effect from 1 April 2023. Under the new amendment, *Geochelone elegans* has been placed in Schedule I, providing the species with the highest level of protection, which includes an absolute ban on hunting/ collection/ trade. In terms of international agreements, the ongoing population declines have resulted in an enhanced awareness of the species' plight. *Geochelone elegans*, along with other species of tortoises (Testudinidae) not listed in Appendix I, was listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as recently as 2016 (CITES 2016). However, it is now listed in Appendix I (CITES 2023), which provides considerably stricter legal protection in all signatory nations. Similarly, the Indian Star Tortoise, as mentioned above, was listed as being of Least Concern on the IUCN Red List of Threatened Species until 2016 (D'Cruze et al. 2016) but its threat status has since been upgraded to Vulnerable (Choudhury et al. 2020).

Despite the increased awareness of the species' situation, little can be done until certain steps are taken. The rigor and enforcement of legislative protection in countries where the Indian Star Tortoise is native must be strengthened. An additional reason for the increased exploitation of the species is the lack of strict legislative protection in other nations. For example, Thailand's Wild Animal Reservation and Protection Act (WARPA) does not protect this species as it is not native to Thailand, which facilitates the trade (Nijman and Shepherd 2015). Alongside strengthening of the legal framework, an increased cooperation between countries is necessary. Both national and international public awareness initiatives are needed to reduce demand for this threatened species but also to refute religious beliefs and superstitions that contribute to the illegal collection and trade of the species. In addition, although the Wildlife Institute of India has initiated the creation of a genetic database for the species in order to facilitate conservation efforts, rigorous scientific inquiries are necessary to assess both the current status of populations throughout the range and the impact of the illegal trade. This gentle species must be adequately protected before a combination of threats drives them to extinction.

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