



# Invasive Red-eared Sliders, *Trachemys scripta elegans* (Weid 1838), in Urban Wetlands of Delhi, India

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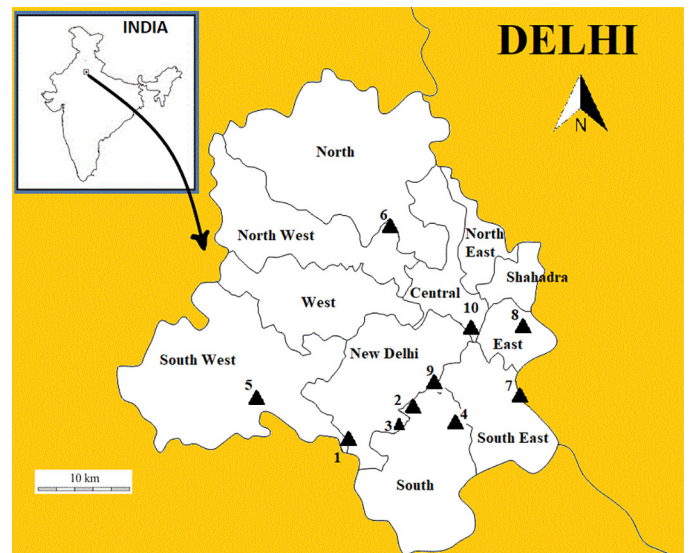
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The Red-eared Slider, *Trachemys scripta elegans* (Weid 1838), which is native to the eastern United States (Rhodin et al. 2009; Powell et al. 2016), has become the most widely distributed turtle in the world (Ramsay et al. 2007; Vyas 2019). Among the 100 worst invasive alien species (Lowe 2004), it is present in high densities across all continents (except Antarctica), where it poses a major threat to many of the world’s native turtles (Lever 2003; Ernst and Lovich 2009).

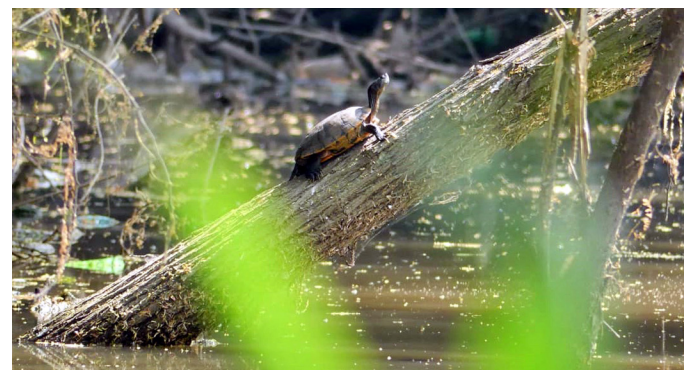
Large numbers of Red-eared Sliders are imported annually into Indian cities (Vyas 2015), where they are sold primarily as pets (Mukherjee 2013). In India, this species lacks legal protection, sales are not restricted in any way, and these turtles are readily available in local pet shops at prices of INR 200–4,000 (~US\$ 2.70–54.20) (based on a survey of Indian pet dealers). Once they outgrow home aquariums or get sick without proper husbandry, pet owners and even some forestry departments release them into natural bodies of water where they compete with native turtles and fishes for habitat and resources (Singh 2015). Consequently, this species has become established in urban wetlands of many Indian states, where it has been recorded from Karnataka, Andhra Pradesh, Telangana, Maharashtra, West Bengal, Punjab, Rajasthan, Gujarat, and now from the Union Territory of Delhi (Jadhav et al. 2018; Chaudhari et al. 2018; Vyas 2019; Barhadiya and Ghosh 2020).

As part of broader herpetofaunal surveys from January 2016 through October 2020, we surveyed bodies of water like streams, ponds, lakes, impoundments, tanks, and water holes in the Union Territory of Delhi. We conducted intensive searches for turtles using binoculars and field scopes supplemented by informal interviews with various stakeholders that included local community members who are directly dependent on such bodies of water. We did not trap or collect turtles due to a paucity of captive facilities and the lack of necessary permits.

We recorded 23 Red-eared Sliders (Table 1) from ten bodies of water in the Union Territory of Delhi (Figs. 1–2).



**Fig. 1.** Map of the Union Territory of Delhi showing locations where Red-eared Sliders (*Trachemys scripta elegans*) were encountered. Numbers correspond to localities identified in Table 1.



**Fig. 2.** An adult Red-eared Slider (*Trachemys scripta elegans*) basking on the submerged trunk of a Mexican Mesquite (*Prosopis juliflora*) in the Union Territory of Delhi. Photograph by Gaurav Barhadiya.

**Table 1.** Localities where Red-eared Sliders (*Trachemys scripta elegans*) were recorded in Union Territory of Delhi, India. A = Adult; H = Hatchling; J = Juvenile.

Location, District (GPS Coordinates)	Habitat (Area)	Number (Size class)
Aya Nagar Pond, South West (28°28'33.2"N, 77°07'50.0"E)	Pond (4,294 m <sup>2</sup> )	2 (2A)
Hauz Khas Lake, South (28°33'18.3"N, 77°11'31.2"E)	Lake (58,637 m <sup>2</sup> )	2 (1A, 1J)
Mehrauli water tank, South (28°30'49.0"N, 77°10'38.7"E)	Lake (17,670 m <sup>2</sup> )	3 (1A, 2J)
Mittal Garden, Sainik Farm, South (28°30'12.7"N, 77°11'34.1"E)	Pond (19,803 m <sup>2</sup> )	2 (2A)
Najafgarh Drain, Chhawla, South West (28°33'04.0"N, 77°00'54.8"E)	Stream (—)	1 (A)
Bhalaswa Lake, North West (28°44'40.1"N, 77°10'24.2"E)	Lake (431,525 m <sup>2</sup> )	1 (A)
Okhla Bird Sanctuary, South East (28°33'24.4"N, 77°18'23.2"E)	Dam (3,906,470 m <sup>2</sup> )	2 (2A)
Sanjay Lake, Trilok Puri, East (28°36'53.2"N, 77°18'18.8"E)	Lake (154,264 m <sup>2</sup> )	2 (2A)
Sanjay-Van Lake, South (28°31'54.5"N, 77°10'31.6"E)	Lake (7,473 m <sup>2</sup> )	3 (2A, 1H)
Delhi Zoological Park Lake, Central (28°36'21.7"N, 77°14'49.3"E)	Lake (14,790 m <sup>2</sup> )	5 (5A)



**Fig. 3.** A hatchling Red-eared Slider (*Trachemys scripta elegans*) in the Union Territory of Delhi. Photograph by Gaurav Barhadiya.

All sites were in urban areas and turtles were almost certainly released by pet owners. However, turtles are likely to migrate to other nearby bodies of water. Since the first individual was recorded from South Delhi District (Sanjay Van Lake, Hauz Khas) in 2016, the frequency of sightings has increased. We also encountered hatchlings (Fig. 3), suggesting that reproduction is occurring.

Many pet shops in Delhi deal in exotic turtles and many hobbyist keep them in their homes (Fig. 4). The actual numbers are unknown, but if only a small fraction of pet turtles are released, they could pose a serious threat to native aquatic ecosystems. Vyas (2020) described captive Red-eared Sliders chasing and preying on native Indian Roofed Turtles (*Pangshura tecta*) and Flap-shelled Turtles (*Lissemys punctata*) housed in the same enclosure. He also stated that native turtles sympatric with introduced populations of Red-eared Sliders in freshwater ecosystems of India are particularly vulnerable, citing documented examples of these turtles introduced elsewhere in the world competing with and transmitting parasites and pathogens to native species.

Detecting and monitoring invasive populations of Red-eared Sliders is essential, not only in Delhi but throughout the country. Although killing turtles would be unethical, laws and regulations limiting the importation of Red-eared Sliders (and other non-native species) must be implemented along with procedures for manually removing and maintaining exotic turtles. Turtles could be collected using baited fish traps and housed in facilities (e.g., zoos) along with individuals donated



**Fig. 4.** Red-eared Sliders (*Trachemys scripta elegans*) in a home garden (left) and an aquarium (right) of pet owners in Delhi. Photographs by Gaurav Barhadiya.



by pet owners encouraged to turn over unwanted pets instead of releasing them. Also, government guidelines for controlling exotic species might require that individual animals are marked with permanent identification numbers and a “buy-back” scheme would increase the likelihood that turtles are returned to pet shops or donated to captive holding facilities.

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