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Biodiversity Record: Dead-on-road rainbow mud snakes at Kranji

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Subjects: Rainbow mud snake, *Enhydris enhydris* (Reptilia: Squamata: Homalopsidae).

Subjects identified by: Alex Figueroa.

Location, date and time: Singapore Island, Kranji Way adjacent to Kranji Park Carpark A; 26 April 2021; 2146 hrs.

Habitat: Urban parkland. Metalled road between car park and grassy field, at the edge of a large body of freshwater (Kranji Reservoir).

Observers: Alex Figueroa, Sheryl Seet and Thio Hui Bing.

Observation: A dead and squashed example of about 60 cm total length was noted on the road (Fig. 1). On closer inspection, two dead, fully-developed young were observed near the snake's tail, with another dead one lying 5 cm away (Fig. 1). While scanning the area around the snake, four more fully-developed young were found scattered on the road (Fig. 2). All seven young snakes were about 15–20 cm each. It appeared that the adult female was gravid, and while crossing the road, was ran over by a motor vehicle that caused the young to burst out.

Remarks: The status of *Enhydris enhydris* in Singapore has been questioned. First documented from Singapore by Boulenger (1896) based on a specimen collected by R. Swinhoe at the Natural History Museum in London (catalogue number BMNH 1870.1.14.4), this species was not recorded again until 112 years later, when a dead example was found on Neo Tiew Road on 13 April 2008, and a live specimen seen nearby at the Sungei Buloh Wetland Reserve on 13 September 2008 (Lim & D'Rozario, 2009).

Doubt was expressed about *Enhydris enhydris* being native to Singapore, given that those two records were from northwestern Singapore, an area developed for agrotechnological farming, which suggests that the snakes could have been brought in with imported plants (Lim & D'Rozario, 2009). *Enhydris enhydris* is largely aquatic and inhabits stagnant and slow-moving aquatic habitats such as rice paddies, canals, ditches, lakes and rivers, including degraded areas and urban areas (Murphy, 2007), making the wetlands, freshwater marshes, ponds and farms in northwestern Singapore ideal habitat. In considering the species non-native, Lim & D'Rozario (2009) suggested that Swinhoe's specimen was likely a traded animal. As such, *Enhydris enhydris* is considered non-native in Singapore (Baker & Lim, 2012; Charlton, 2020).

Since then, there have only been four more documented records: one photographed shortly before 2010 at the Sungei Buloh Wetland Reserve (Chua, 2010, misidentified as *Xenopeltis unicolor*), three live specimens at Kranji Marshes on 22 October 2013 (Baker & Thomas, 2013), a dead example at Sungei Buloh Wetland Reserve on 14 November 2014 (Kwan & Pascoe, 2015), and a live individual in Sungei Buloh on 3 January 2018 (Serin & Subaraj, 2018). Given that there are suitable habitats in Singapore, and that it has a wide distribution from Sri Lanka northwards along eastern India to Nepal, east to southeastern China, and south through Peninsular Malaysia to Indonesia, including Sumatra, Borneo, Java and Sulawesi (Murphy, 2007), the authors believe that *Enhydris enhydris* should be regarded as native to Singapore. Surely, intensive surveys are needed to better understand the occurrence of the species in the country.

This note presents the first evidence of reproduction in *Enhydris enhydris* in Singapore. The species gives birth to live young, with litter sizes ranging from four to 18 young. Reproduction throughout its range can either be annual or biannual, and either aseasonal or seasonal (Murphy, 2007). Given how fully developed the young were, the featured observation indicates that in Singapore *Enhydris enhydris* gives birth to at least seven young sometime around April or May.

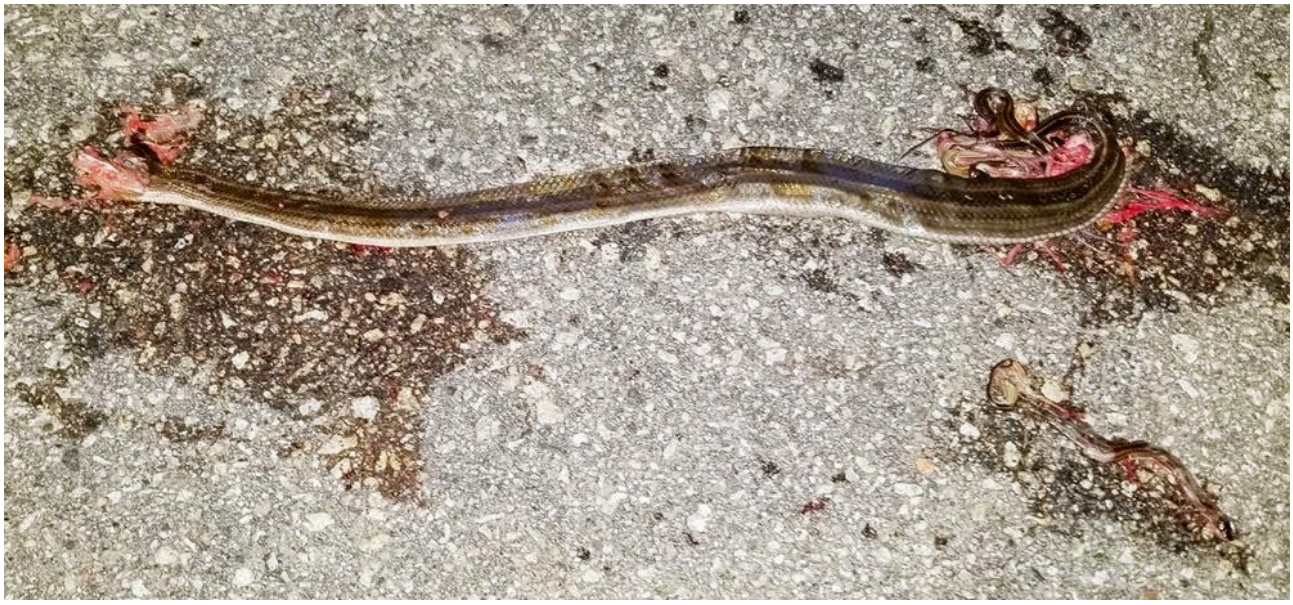

Fig. 1. Dorsal view of dead-on-road adult female *Enhydris enhydris* with two dead, fully-developed young at its tail (top right) and one lying 5 cm away (bottom right). (Photograph by: Alex Figueroa).

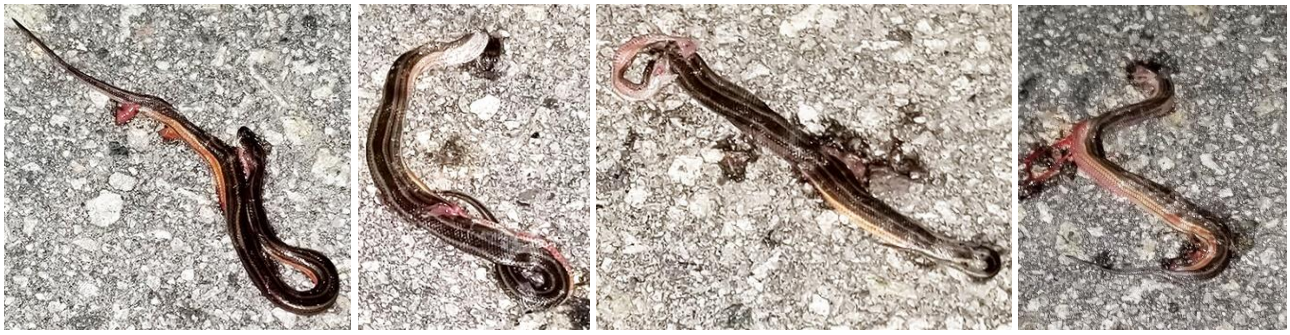

Fig. 2. Four dead-on-road, fully-developed young *Enhydris enhydris*, squashed and scattered away from the adult female. (Photographs by: Alex Figueroa).

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