



Road Mortality of an Endangered Tricarinate Hill Turtle, *Melanochelys tricarinata* (Blyth 1856)

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Road mortality can alter the demography of animal populations and also eliminate their connectivity (Forman and Alexander 1998; Trombulak and Frissell 2000; Jackson and Fahrig 2011). Turtles are especially susceptible to road death; with as many as 98–100% of individuals killed during their first road crossing attempt at one locality in Florida, USA (Aresco 2005). Turtles frequently encounter roads during long-distance seasonal movements, and road mortality of adults leads to population declines (Gibbs and Shriver 2002; Marchand and Litvaitis 2004). Roads also may act as movement barriers for populations that persist in their proximity, possibly altering behavior (Shepard et al. 2008; Schwab and Zandbergen 2011; Beyer et al. 2016).

The Tricarinate Hill Turtle (*Melanochelys tricarinata*) inhabits terrestrial terrain along streams and rivers (Dutta et al. 2009). It is limited to the northern parts of the Indian Subcontinent, ranging from the Himalayan foothills of India eastward through the rest of northern India, southern Nepal, and northern Bangladesh, to Arunachal Pradesh in northeastern India (Das 1991, 2009; Busack 1994; Horne et al. 2020). The Tricarinate Hill Turtle is listed as Endangered (EN) in the IUCN Red List (Horne et al. 2020) and is protected under Schedule I of the Indian Wildlife Protection Act of 1972. The species has also been placed in the Red Data Book of Nepal (Shah and Tiwari 2004).

At 1122 h on 16 July 2021, we observed a road-killed *M. tricarinata* on the Clement Town Road, Dehradun, Uttarakhand, India (30.2680°N, 77.9986°E) (Fig.1). The area near a Sal forest patch with dense canopy cover had experienced high rainfall on the previous day. The road death of this turtle likely was the result of this individual seeking to thermoregulate on the black tar road.

For ectotherms like reptiles thermoregulatory behavior is a critical mechanism (Bansal 2020) for maintaining proper body temperature (Meek 1995). Black tar roads help raise body

temperatures during the daytime and slow the release of heat at night, attracting reptiles to the roads for thermoregulation (Bernardino and Dalrymple 1992; Bamabaradeniya et al. 2001; Selvan et al. 2011; Karunarathna et al. 2013; Bansal 2020).

Although the death of a single endangered turtle is merely demonstrative of the potential harm of traffic to turtle populations, installation of exclusion structures like fences or gravity walls could reduce road mortality, and fragmentation could be reduced by installing population connectivity structures such as eco-passages and bridges (Dodd et al. 2003; Aresco 2005; Ashley et al. 2007).



Fig. 1. A road-killed Tricarinate Hill Turtle (*Melanochelys tricarinata*) on the Clemantown Road of Dehradun, Uttarakhand, India. Photograph by Priyanka Das.

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