# Title Free-ranging dogs threaten reintroduced Chinese water deer

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**Abstract:** Chinese water deer(*Hydropotes inermis*),

**Keywords:** *Hydropotes inermis***,** Free-ranging dog, Survival rate at least 3-5 not repeated in the title

**Resumen:** El ciervo acuático chino (*Hydropotes inermis*),

**Palabras clave:** *Hydropotes inermis*,

**Introduction**Global biodiversity loss is currently exceeding the advancements made by humanity in tracking and monitoring the intra- and inter-species interactions, along with associated ecosystem changes, at an unprecedented pace in human history (Dirzo et al. 2014). The ongoing trend of climate change has rightly drawn widespread attention (Pecl et al. 2017, Malhi et al. 2020). Anthropogenically induced changes, specifically pollution, changes in land/sea use, direct exploitation of natural resources, and invasive alien species, pose additional substantial threats to wildlife (Sala et al. 2000, Maxwell et al. 2016). Land expansion driven by development eradicates once-dominant natural ecosystems, leading to widespread habitat fragmentation and isolation (Li et al. 2022). Urbanization, typically exacerbated by pollution and invasive alien species, further squeezes the living space of wildlife (Garcia-Fernandez et al. 2005, Pyšek et al. 2020).

As human activities extend globally, domestic species, along with others kept as pets or closely associated with people, have been introduced to continents and numerous islands worldwide (Wandeler et al. 1993, Long 2003, Ottoni et al. 2017). However, these animals may become free-ranging species with access to the outdoor environment after partial or complete abandonment by owners (Vanak & Gompper 2009). This, in turn, exacerbates ecological issues caused by cosmopolitan distribution (Feldmann 1974, Young et al. 2011, Simberloff 2013). For example, free-ranging dogs (*Canis familiaris*), owing to their diverse diet, can significantly impact wildlife through predation (Ritchie et al. 2013), competition (Vanak & Gompper

2009), and disturbance (Feldmann 1974, Zapata-Ríos & Branch 2016, Weng et al. 2022). Today, free-ranging species have evolved into successful global invaders (Fantle-Lepczyk et al. 2022). Interestingly, globally, 188 species have been identified as threatened by free-ranging dogs (Doherty et al. 2017), potentially leading to local extinctions (Borroto-Páez 2009). As former human assistants (e.g., facilitate

hunting, or protect property), dogs receive less attention, despite being potential predators of, disturbers of, or competitors with a wider variety of native species, than others (Feldmann 1974, Contreras-Abarca et al. 2022). During the COVID-19 Pandemic, the population of free-ranging dogs in urban areas increased steadily (Lan et al. 2021, Carroll et al. 2023). Clustered dogs are the most abundant carnivore, which have spread to the outskirts of cities, significantly disrupting urban ecosystems. This poses a particular threat to recently reintroduced deer.

The Chinese water deer (*Hydropotes inermis*, Fig. 1), the most primitive deer in the family Cervidae, is typically found in waterside habitats (e.g., reeds, intertidal zones, or riverbank slopes; Sheng 1992). The rapid process of urbanization has led to a shrinking population size of Chinese water deer, resulting in a fragmented distribution pattern (Sheng 1992). In this regard, Shanghai, within its historical distribution area, initiated the reintroduction project to enhance biodiversity in 2006 (Su et al. 2008, Chen et al. 2016). From 2009 to 2010, the hard release of Chinese water deer in locations such as Binjiang Forest Park and Nanhui East Shoal, as evidenced by monitoring, led to population continuity, with the population gradually adapting to the free environment (Chen et al. 2016, He et al. 2016). However, during recent reintroduction efforts in Laogang and Nanhui, Shanghai, where Chinese water deer are adapting to the open urbanized landscape, they also encounter a significant presence of free-ranging dogs. We hypothesize that an inverse correlation may exist between dogs and reintroduced deer in the same area.

**Figure 1.** Chinese water deer are staring.

**Material and Methods**

**Figure 2.** Map of study area   here or with the results

**Results**

**Discussion**

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