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Habitat Use by Asian Elephants (*Elephas maximus*) in a Human-Dominated Landscape in Lunugamwehera, Sri Lanka

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Abstract

In Sri Lanka, the home ranges of many elephants extend outside protected areas. Hence understanding patterns of habitat use in human-dominated landscapes is crucial for their conservation. Tracking data from GPS collars provide valuable insight into elephant movement, habitat use, and behavioural adaptations. In this study, two female elephants from two different family groups, which frequented areas outside Lunugamvehera National Park (Southern Sri Lanka), were fitted with GPS collars and monitored for 14 months. The GPS collars provided six position fixes per day (i.e.,four hourly). A total of 3,160 points from these two individuals were visited to record habitat types, crop types, and prevailing mitigatory measures. The results indicate that in both groups the diurnal patterns of habitat use were markedly different to the nocturnal habitat use. During the day (0600 to 1800 hrs.) the elephants predominantly used forest habitats and mature scrubs whereas at night (1900–0500 hrs.) the elephants used human-dominated habitats and returned to the forests early morning. The elephants did not frequent the actively cultivated areas (corn, sugarcane, millet, banana, and paddy), but primarily used abandoned crop fields and scrub habitats. This was most likely due to the presence of deterring mechanisms such as electric fences, crop guarding, and hanging fences in actively cultivated fields also due to direct threats such as shooting by farmers. This study indicates that female elephant groups do not risk raiding more nourishing and perhaps more palatable crops when there is the availability of forage elsewhere and where deterrents are in place. Harvested and off-season crop fields, especially sugarcane and paddies, were used opportunistically because they were not guarded. These findings may support the idea that habitat selection of female elephant groups which typically comprise adult females and young of both sexes are driven by a trade-off between food availability and anthropogenic risks. Another important observation was that, although located in close proximity to the Lunugamvehera National Park, none of the recordings over the 14 months were within the protected area, suggesting that the habitat ranges of these two groups are entirely outside the protected area network. The findings of the present study show the importance of maintaining a mosaic of habitats including forest and scrub patches within human-dominated landscapes and the need for using deterrent mechanisms for protecting cultivations, both of which would be crucial to sustained coexistence between people and elephants outside protected areas.

Keywords: Female elephants, Habitat use, Risk-benefits, Human-elephant conflict, GPS tracking