Supplementary Information S2: Estimating the maximum dispersal distance of the focal species in our study area

We approximated the maximum dispersal distances, using the home range size and body size of the antelopes. Studies in different biotopes have reported different home range sizes for blackbuck, chinkara, and nilgai. The smallest home range estimated for blackbuck is 0.4 km2 in Kanha national park, Madhya Pradesh [1], while the most extensive estimated home range is 19.62 km2 in Gajner Sanctuary, Rajasthan [2]. Studies from Tamil Nadu, Odisha, Gujarat, and Nepal have estimated the blackbuck home range to be 7.66 km2 [3], 5.4 km2 [4], 2.5 km2, and 5.71 km2 [5], respectively. Another study at Kanha, which is closest to our landscape, reported the home range size of blackbuck to be 2.13 km2. Studies on chinkara and nilgai have reported its maximum home range to be 2.4 km2 [6], 7.3 km2 [7] which we have used in our analysis. Two very recent studies have reported them to be 2.58 km2 [8] and 8 km2 [9]for chinkara and nilgai, respectively.

As there is no documentation on blackbuck home range size from the study landscape, we assumed a safe estimate of 2.5 km2. Applying the power law [10] we calculated, the maximum dispersal distance to be 46.45 km. We rounded-off this value to the nearest whole number 46. The corridor analysis has been carried out in 2×2 km grids; therefore, this small rounding-off will not affect the results. Similarly, we calculated (and rounded-off) the maximum dispersal distances of chinkara and nilgai, to 45 km and 80 km, respectively. No studies have investigated four-horned antelopes' home range size [11], so we calculated their maximum dispersal distance using their body size. Considering their average mass to be 20 kg [12], we estimated their maximum dispersal distance as 36 km. Here, we reiterate that excessive precision in estimating maximum dispersal distance is redundant as our analyses have been carried out in a coarse spatial grain of size 2×2 km. We did not consider the studies outside the native range of the focal species for this analysis.

Table 1. Estimate of dispersal distance (km) based on home range (km2) or body size (kg).   
HR = Home Range; BS = Body Size. Power law formula used as per Santini et. al. (2013).

|  |  |  |  |
| --- | --- | --- | --- |
| **Species** | **Home Range Size (km2)** | **Conversion**  **Formula Used** | **Approximated maximum dispersal distance (km)** |
| **Blackbuck** | 2.5 | 29.38 × HR0.5 | 46 |
| **Chinkara** | 2.4 | 45 |
| **Nilgai** | 7.3 | 80 |
|  | **Body weight** |  |  |
| **Four-horned antelope** | 20 | 5.97 × BS0.6 | 36 |

**References**1. Ranjitsinh, M. *Indian blackbuck*; Natraj Publishers, 1989; ISBN 81-85019-18-5.

2. Kumar, A.; Niraj Distribution Pattern of Black Buck (Antelope cervicapra) at Gajner Wild Life Sanctuary, Bikaner (Rajasthan). *International Journal of Scientific Research and Reviews* **2016**, 26–34.

3. Prasad, N.; NLNS, P. Home range size of blackbuck, Antilope cervicapra, at Mudmal. **1983**.

4. Mahato, A.K.R.; Raziuddin, M. *Status, ecology & behaviour of Antilope cervicapra (Linnaeus, 1758) in proposed community reserve for blackbuck, Ganjam District, Orissa, India*; Zoological Survey of India, 2010; ISBN 81-8171-265-X.

5. Khanal, P.; Khanal, S.; Jnawali, S.; Pathak, S. STUDY ON THE LAND USE OF PROPOSED BLACKBUCK CONSERVATION AREA, KHAIRAPUR, BARDIA DISTRICT AND HABITAT OPTIONS FOR TRANSLOCATION OF BLACKBUCK (Antelope cervicapra) AT ROYAL SUKLAPHANTA WILDLIFE RESERVE IN KANCHANPUR DISTRICT, NEPAL, BY USING GIS. *Local Governance Programme United Nations Development Prgramme, Nepal* **2002**.

6. Dookia, S. Habitat preference, abundance and group size of Indian gazelle (Gazella bennetti Sykes, 1831) in semi arid region of Rajasthan. **2002**.

7. Sankar, K. The ecology of three large sympatric herbivores (chital, sambar, nilgai) with special reference for reserve management in Sariska Tiger Reserve, Rajasthan. *PhD Thesis. University of Rajasthan* **1994**.

8. Jaipal, B. Home range and territorial activities of Chinkara (Gazella bennetti) in the Thar landscape. *Journal of Experimental Zoology, India* **2020**, *23*, 1431–1434.

9. Vaghela, M.; Dodia, P.; Shukla, A. Study on Group Composition of Blue Bull (Boselaphus Tragocamelus). *ISSN 2319-4361 (Indexed in Google Scholar)* **2020**, *9*, 747.

10. Santini, L.; Di Marco, M.; Visconti, P.; Baisero, D.; Boitani, L.; Rondinini, C. Ecological correlates of dispersal distance in terrestrial mammals. *Hystrix, the Italian Journal of Mammalogy* **2013**, *24*, doi:10.4404/hystrix-24.2-8746.

11. Sharma, K.; Rahmani, A. Four Horned Antelope or Chowsingha (Tetracerous quadricornis, Blainville, 1816). *ENVIS bulletin (Wildlife and Protected Areas): Ungulates of India* **2005**.

12. Sankar, K.; Johnsingh, A.; Acharya, B. Blue bull or nilgai ( *Boselaphus tragocamelus*, Pallas, 1766). *Ungulates of India. ENVIS bulletin: wildlife and protected areas* **2004**, *71*, 120–143.