Using distance sampling with camera traps to estimate the density of group-living and solitary mountain ungulates

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SUPPLEMENTARY MATERIAL 1 Example of how we used field measurements with a calibration pole to develop a regression equation for estimating the distance of animals from the camera trap.
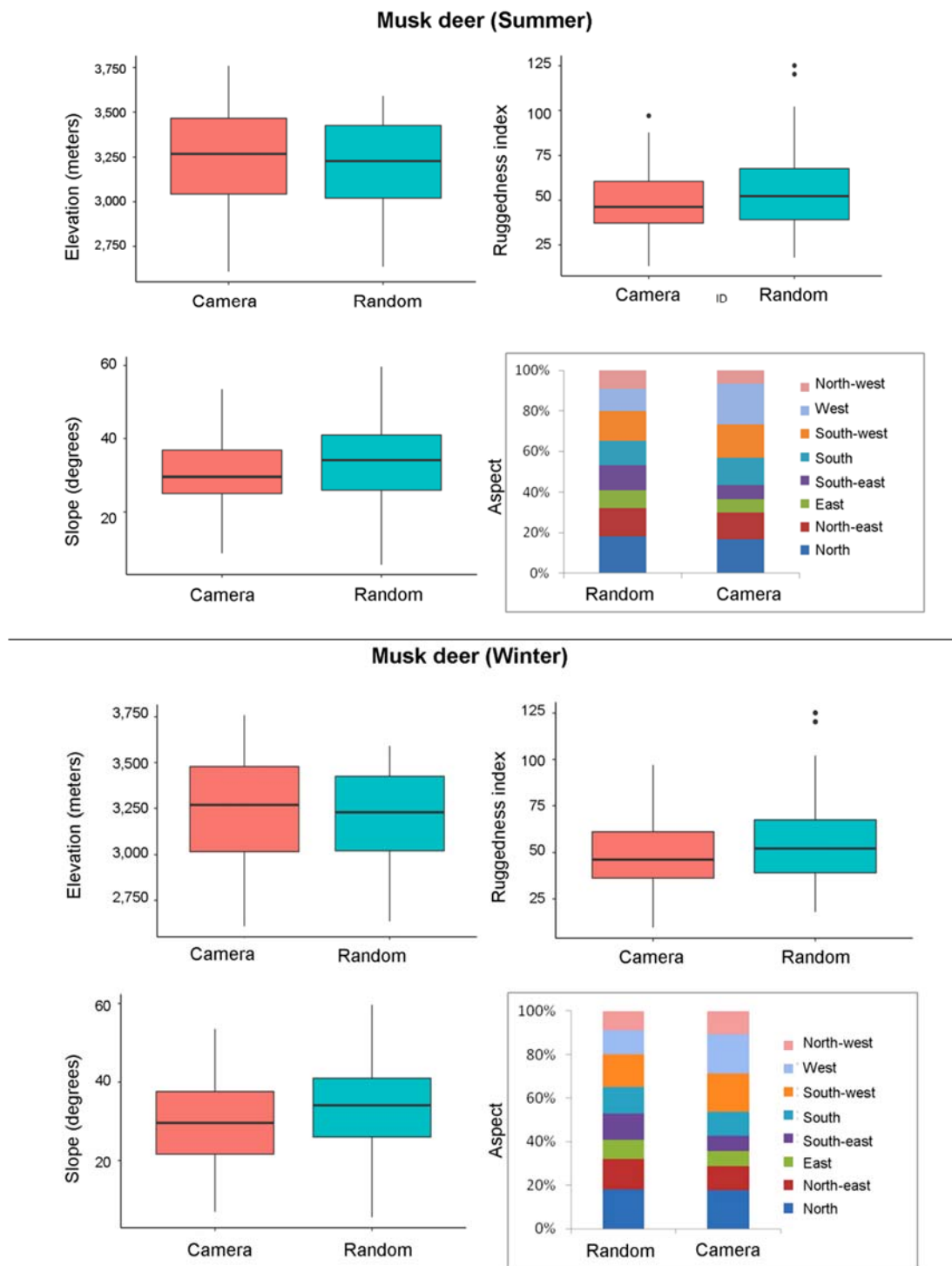
(a) Table showing the measurements taken during the installation of the camera. We took measurements with a pole of known height (here 50 cm) at known distances from the cameras, in the centre and along both sides of the camera's field of view.

Size (height) on the image (cm)	Actual size/height of calibration pole (cm)	Side of camera field of view	Calibration distance (cm)	Ratio image size: actual size
10	50	Right	100	0.200
5.3	50	Right	200	0.106
3.5	50	Right	300	0.070
2.8	50	Right	400	0.056
2.3	50	Right	500	0.046
1.9	50	Right	600	0.038
1.6	50	Right	700	0.032
1.5	50	Right	800	0.030
1.3	50	Right	900	0.026
5.3	50	Left	200	0.106
3.7	50	Left	300	0.074
2.9	50	Left	400	0.058
5.0	50	Centre	200	0.100
3.5	50	Centre	300	0.070
2.1	50	Centre	500	0.042
1.9	50	Centre	600	0.038
1.6	50	Centre	700	0.032
1.4	50	Centre	800	0.028
1.2	50	Centre	900	0.024
1.1	50	Centre	1,000	0.022

(b) We developed a regression equation using the ratio of image size to actual size of the calibration pole at known distances from the camera. We then used this equation to calculate the distances of photo-captured animals from the camera, based on their size in the camera image. In this case the equation is $y = 18.528x^{-1.057}$ $R^2 = 0.9966$, where y is the distance and x is the ratio.
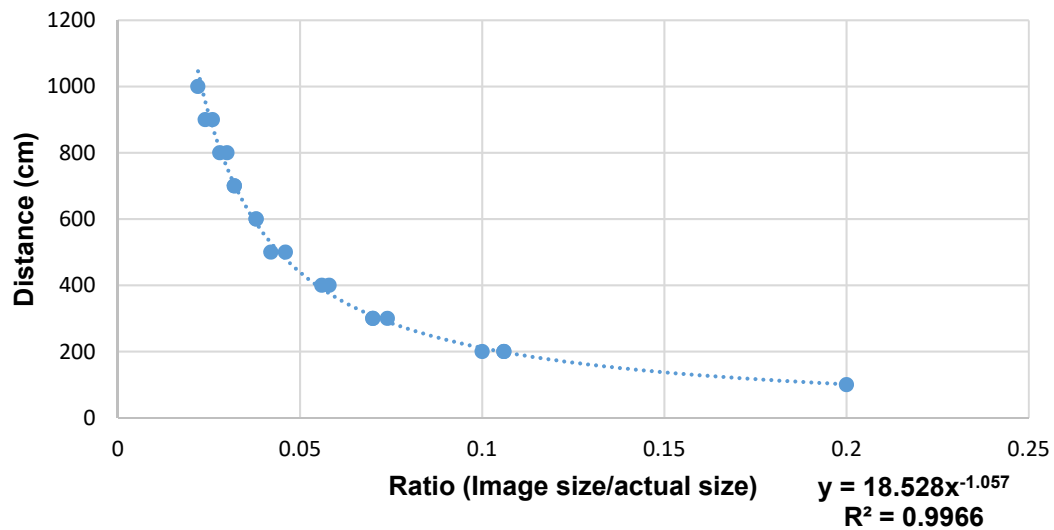
SUPPLEMENTARY FIG. 2 Results of bias test for bharal captures. We tested our sampling representation by comparing habitat features (elevation, slope, ruggedness and aspect) of camera-trap locations and 100 randomly generated points.