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Appendix 1. Distinguishing between travel and stopover days

Daily travel speeds (in km/d) of migrating marsh harriers *Circus aeruginosus* were calculated for segments that were defined by 'best of duty cycle locations' (see main text). The frequency distribution of (log-transformed) daily travel speeds revealed two peaks; i.e. this distribution was bi-modal (Fig. A).

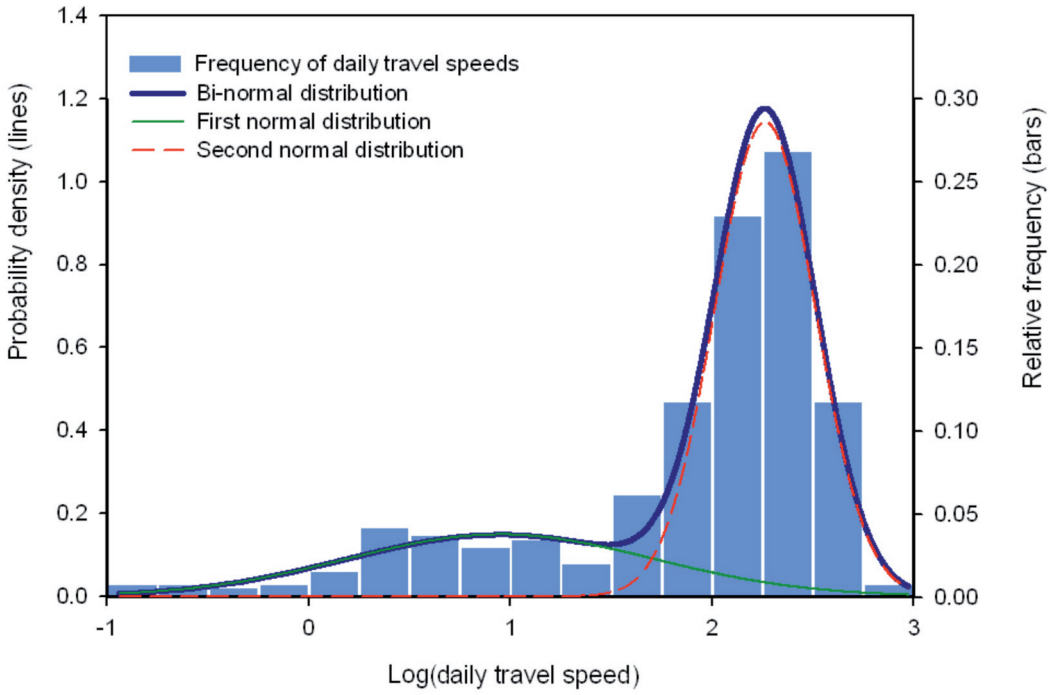

Figure A. Bars depict the relative frequency distribution of (log transformed) daily travel speeds (right y-axis). The blue solid line is the probability density function of a bi-normal distribution, which is the sum of two normal distributions, the green and the red curve, respectively (left y-axis).

The fit of the sum of two normal distributions with a probability density of $q \cdot N(\mu_1,\sigma_1)+(1-q)\cdot N(\mu_2,\sigma_2)$, where q is a scaling coefficient between 0 and 1, was compared with that of a single normal distribution $N(\mu,\sigma)$, with mean μ and standard deviation σ. Taking the difference between the number of estimated parameters into account, the bi-normal distribution indeed fitted significantly better than the single normal distribution (log-likelihood ratio test, $X^2_3 = 148.5$, $P < 0.001$; Sokal and Rohlf 1995).

The first distribution (green curve in Fig. A) has a mean of 8.9 km/d (back-transformed value), and is thought to be related to stopover days, and days with slow progress due to intensive fly-and-forage migration (Strandberg and Alerstam 2007). The second distribution (red dashed curve in Fig. A) has a mean of 183.7 km/d, and is thought to be related to travel days. The intercept of these curves (50.3 km/d) can be seen as a threshold value that distinguishes between travel days (daily speeds > 50.3) and stopover days (daily speeds < 50.3).

References

Sokal, R. R. and Rohlf, F. J. 1995. Biometry, 3rd edition. – W. H. Freeman and Co., New York.
Strandberg, R. and Alerstam, T. 2007. The strategy of fly-and-forage migration, illustrated for the osprey (*Pandion haliaetus*). – Behav. Ecol. Sociobiol. 61: 1865–1875.