

Supporting on-line material

Norris and Taylor

Predicting the consequences of carry-over effects on migratory populations

Relationship between habitat quality and individual quality

Estimates of carry-over effects may be confounded by the correlation between habitat quality and individual quality. However, evidence in Barn swallows and American redstarts suggests that individual success is influenced by habitat quality. In Barn swallows, the annual change in individual arrival date is correlated with an annual change in winter habitat quality as measured by NDVI (Saino et al. 2004). In redstarts, the annual change in individual arrival date on the breeding grounds is correlated with a change in the quality of habitat used the previous season on the wintering grounds (as measured by stable-carbon isotope signatures on arrival; Norris et al. unpublished data). In addition, experimental removals of redstarts on the wintering grounds indicate that individuals upgraded to higher quality winter habitat are in better condition and depart earlier for spring migration compared to similar-age individuals in poor quality habitat (Studds & Marra, *in press*). These lines evidence suggest that habitat quality has a strong influences on success over and above individual quality.

References

Saino, N., Szep, T., Romano, M., Rubolini, D., Spina, F. & Moller, A. P. 2004 Ecological conditions during winter predict arrival date at the breeding quarters in a trans-Saharan migratory bird. *Ecol. Lett.* **7**, 21-25.

Studds, C. E. & Marra, P. P. Nonbreeding habitat occupancy and population processes: a removal experiment with a migratory bird. *Ecology*, in press.