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Appendix 1

Additional description of the estimation of forest cover around focal trees

In the study plot, the total extent of forest cover at landscape scale remained constant throughout the study period (2007-2009), as no tree losses from logging, fires or other large-scale disturbances occurred, and tree fall from natural causes affected less than 0.1% of standing trees (Martínez et al. unpubl.). Focal trees were arbitrarily chosen throughout the entire plot each year in an attempt to represent a similar gradient of neighborhood forest cover between years. The identity of the focal trees selected for sampling changed from one year to another because some failed to fruit every season. We thus considered a scenario in which the amount of forest cover around focal trees remained constant across years, but varied between different focal trees.

We explicitly analyzed the between-year variations in forest cover at both R15 and R15-40 by using generalized linear models (GLMs), with a Normal error distribution and a Log link function. Independent analyses were performed for each focal species. Based on measurements of the mean and dispersion values of the amount of forest in the neighborhood of focal trees (Fig. A1), our study design assured that the spatial gradient of forest cover in the neighborhood of focal trees was equally broad across study years. Moreover, forest cover remained constant, on average, across study years, as no between years differences were found in the forest cover around either species at R15 or R15-40 neighborhood scales (GLM: $\chi^2 > 2.92$, n = 48, for all tests).

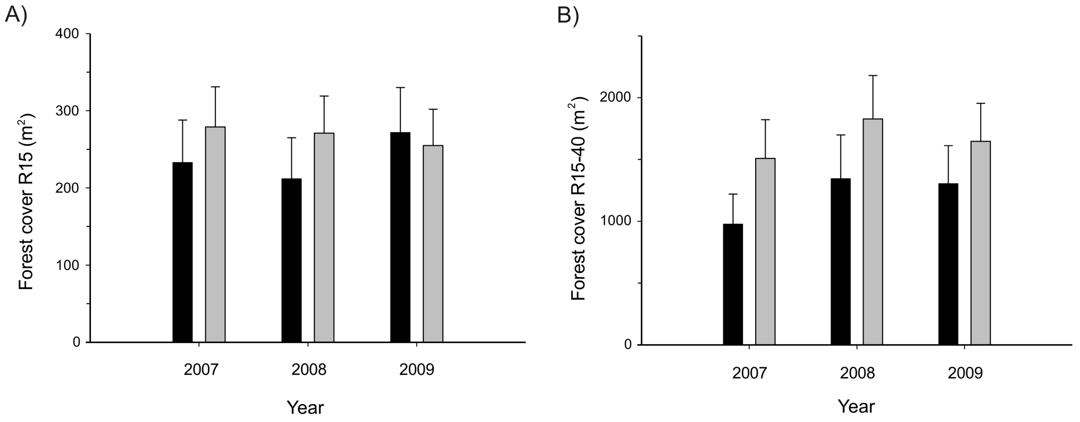

Figure A1. Mean forest cover (m^2) ± SE in the concentric areas, at A) 15 m (R15) and B) 15 to 40 m (R15-40) radii, chosen to represent ecological neigborhoods around *Crataegus monogyna* (black bars) and *Ilex aquifolium* (gray bars) focal trees (n = 16).

Appendix 2

Details on the methodology of frugivory estimates

Abortion of fruits in the studied species happens at an early stage of fruit development (June-August; Obeso 2004, Chacoff et al. 2008). Fruit counts, on all fruiting trees as well as on the labeled branches, were done at the beginning of fruit ripening, so abortions did not cause any bias in the frugivory estimates. The activity of non-disperser pulp-eaters was also considered. Those fruits attacked by pulp eaters were easily distinguishable, presenting partial depulpation while retaining the seeds. The impact of the activity of pulp eaters, such as small passerines (*Erithacus rubecula*, *Parus* spp., etc.), on the frugivory estimates was negligible too, affecting less than 0.6% of labeled fruits (Martínez et al. unpubl.).

We assumed that almost all fruits picked from branches were actually swallowed by thrushes (and hence their seeds were dispersed), and that only a small proportion of picked fruits fell under trees or were consumed by other animals (e.g. Guitián et al. 2000, García et al. 2013). We further considered that the dropping of fruits by thrushes was unrelated to the characteristics of neighborhood or fruit size constraints, but rather due to thrushes' rejection of infested fruits (Manzur and Courtney 1984) or handling failures (Guitián et al. 2000).

Figure A2. Fruited branches of A) *Crataegus monogyna* and B) *Ilex aquifolium* showing intact fruits and bare stalks (indicated by white arrows) after foraging by birds. Photo credits: Daniel Martínez.

References

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Guitián, J. et al. 2000. Zorzales, espinos y serbales. Un estudio sobre el consumo de frutos silvestres de las aves migratorias en la costa occidental europea. – Univ. de Santiago de Compostela.

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Obeso, J. R. 2004. Seed provisioning within holly fruits: test of the hierarchical model. - Evol. Ecol. 18: 133-144.