

Landscape change promotes population differentiation at a small geographic scale

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Background

Human-induced landscape change often puts organisms into novel ecological environments that may induce rapid population differentiation at exceedingly small geographic scales. However, the smallest threshold distance at which phenotypic divergence may occur still remains to be determined.

OBJECTIVE: To investigate how human-induced changes in landscape configuration can drive morphological differentiation between nearby (10 km) bird populations.

Methods

We used a 5-year (2008-2012) data set to examine morphological differentiation and site fidelity¹ of red-necked nightjars (*Caprimulgus ruficollis*) breeding in a mosaic landscape of cattle-grazed pastures and pine tree plantations (Fig.1a), and a natural reserve where human access and activities are restricted (Fig. 1b).

Nightjars were captured during weekly transect counts, individually marked, and measured for skeletal body size (keel length) and tail and wing length.

Foraging opportunities for nightjars in both areas were estimated from aerial prey abundance² and proximity between nesting and foraging sites³.

Results

1. Breeding birds from the managed area were significantly larger in size, but not in tail or wing length, than those from the natural reserve.
2. Nightjars had to travel longer distances in the natural than in the managed area to commute between nesting (shrublands) and foraging sites (roads).
3. Relative food availability for nightjars was similar in the two study areas
4. No individual changed between areas (out of 1130 captures overall), indicating high site fidelity.

Conclusions

Human-induced changes in landscape configuration may promote population divergence at microgeographic scales.

The close proximity between foraging and nesting sites in the managed area leads to increased food intake and growth rates of nestlings and, as a result, they attain larger adult sizes in relation to those in the natural site.

High site fidelity may contribute to maintain the body-size differences between the two areas.

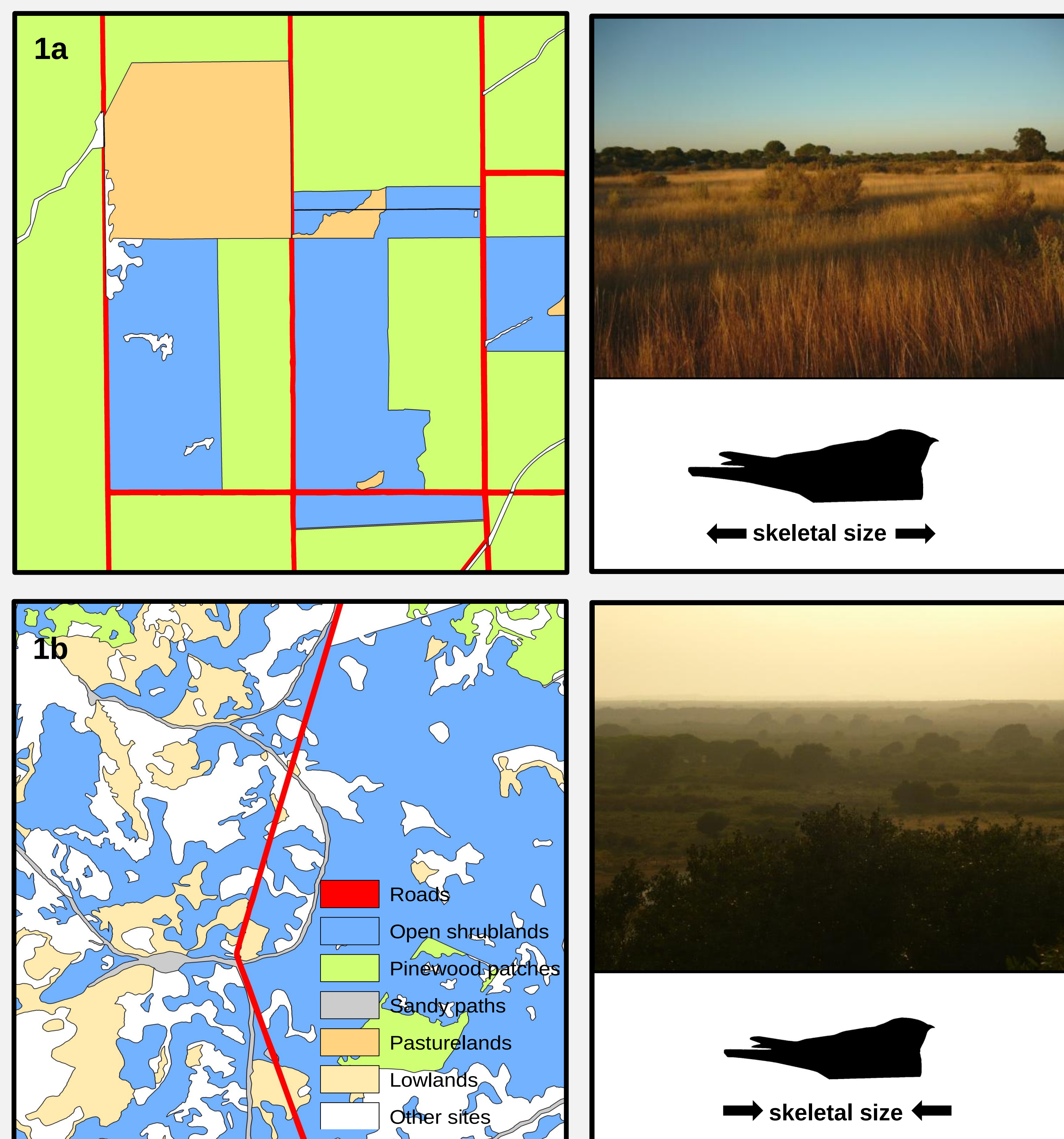


Figure 1. Schematic differences between the managed (1a) and the natural area (1b) in landscape configuration and skeletal body size of nightjars.

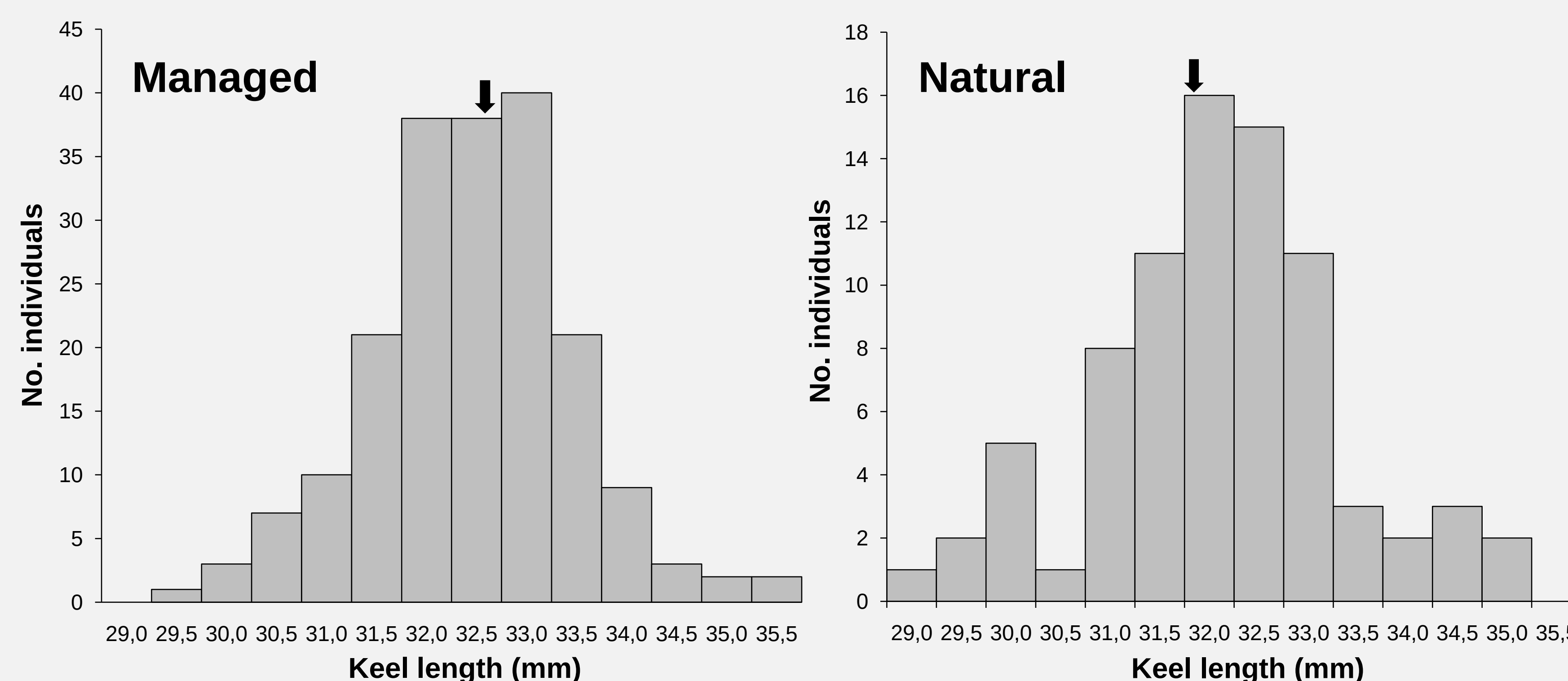


Figure 2. Body size distributions of red-necked nightjars in the managed and the natural area. Arrows denote means.

Acknowledgements

We thank Carlos Davila, Irene Castaneda, Marina Moreno, Alberto Álvarez, José Luis del Valle and Luis García for help during data collection. SEO/Birdlife provided partial support. Personnel from the LAST-EBD helped with the GIS analyses.



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<https://www.facebook.com/Nightjaring-784192548268346/>

