


# Cattle-driven forest disturbances impact ensemble composition and activity levels of insectivorous bats in Mediterranean wood pastures

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**Abstract** Forests can be modified by fine-scale disturbances such as those prompted by cattle grazing, but their impacts on biodiversity are far from being understood. Here, we investigate the response of insectivorous bats to cattle-driven forest disturbances, using a savanna-like Mediterranean agroforestry system, the Portuguese *montado*, as study system. In doing so, we compared bat ensemble composition and activity levels of bats across sites that differed in how frequently they were used by free-ranging cattle. Specifically, we selected sites regularly used by cattle

(central places) and sites seldom used (grazing sites). We found strong between-site differences in both bat species composition and activity levels, with lower diversity and activity in central places compared to grazing sites. These response patterns, corresponded to marked between-site differences in tree cover, seemingly driven by cattle use given the lower levels of tree regeneration and vegetation productivity in central places compared to grazing sites. Our work therefore demonstrates that it is not only severe forest loss and fragmentation that has an impact on insectivorous bats, but also when these processes operate at fine spatial scales. We thus suggest that fine-scale forest disturbances, particularly those driven by recurrent cattle use, cannot be neglected in the conservation management of agroforestry systems. In this context, we propose some management strategies aimed at counteracting the impact of cattle-driven disturbances on biodiversity in general, and on insectivorous bats in particular.

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