

The conservation value of tree decay processes as a key driver structuring cavity nest webs in South American temperate rainforests

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Abstract

South American temperate rainforests, a global biodiversity hotspot, have been reduced to nearly 30% of their original extent and most remaining stands are being degraded. Cavity-nesting vertebrate communities are dependent on cavity-bearing trees and hierarchically structured within nest webs. Evaluating the actual degree of cavity dependence (obligate, non-obligate) and the preferred attributes of trees by cavity nesters is critical to design conservation strategies in areas undergoing habitat loss. During three breeding seasons (2010–2013), we studied the cavity-nesting bird community in temperate rainforests of Chile. We found the highest reported proportion of tree cavity nesters ($n = 29$ species; 57%) compared to non-cavity-using birds for any forest system. Four species were excavators and 25 were secondary cavity nesters (SCNs). Among SCNs, ten species were obligate and 15 were non-obligate cavity nesters. Seventy-five percent of nests of SCNs were located in cavities produced by tree decay processes and the remaining 25% were in cavities excavated mainly by *Pygarrhichas albogularis* and *Campephilus magellanicus*. Nest web structure had a low dominance and evenness, with most network interactions occurring between SCNs and large decaying trees. Tree diameter at breast height (DBH) was larger in nest-trees (57.3 cm) than in available trees (26.1 cm). Cavity nesters showed a strong preference for dead trees, both standing and fallen (58% of nests). Our results stress that retaining large decaying and standing dead trees (DBH > 57 cm), and large fallen trees, should be a priority for retention in forest management plans in this globally threatened ecosystem.