

## **Interspecific networks of cavity-nesting vertebrates reveal a critical role of broadleaf trees in endangered Araucaria mixed forests of South America**

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### **Abstract**

Cavity-nesting animals and their nest trees are linked in interspecific facilitation networks known as nest webs, which play key roles in forest function but vary across biomes and with human perturbation. We examined the composition, structure and function of nest webs between two endangered old-growth forests representing the last remnants of the ancient coniferous family Araucariaceae in South America: pewen (*Araucaria araucana*; Endangered) in temperate Chile (2010–2018), and Parana pine (*Araucaria angustifolia*; Critically Endangered) in subtropical Argentina (2006–2018). Pewen and Parana pine accounted for 30 and 9% of forest basal area, but only 2 and 5% of nesting cavities, respectively. Instead, cavity-nesting birds and mammals nested disproportionately in coexisting broadleaf trees. Species richness, interaction richness, and mean number of links per species were much higher in Parana pine forest than in pewen forest, but the two nest webs had similar levels of evenness and nestedness. Most secondary cavity-nesting species depended on cavities formed by decay in *Nothofagus* spp. (98% of nest cavities in pewen forest) or *Apuleia leiocarpa* (26% of nest cavities in Parana pine forest). An exception was the globally endangered Vinaceous Parrot, a Parana pine seed disperser, which made 50% of its nests in decay-formed cavities in Parana pine. To conserve the ecosystem functions of endangered Araucaria forests it is important to protect and recruit not only Araucaria trees but also a mix of broadleaf trees that can confer resilience to nest webs in the face of major disturbances.

### **Keywords**

Cavity-nesting birds; Ecological network; Interspecific interactions; Neotropics; Nest web; Old-growth forest