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ABSTRACT

Over the last decade, ecoacoustics has quietly revolutionized ecological monitoring. Its applications range from tracking environmental changes to assessing the trajectory of threatened species and monitoring invasive animals. While multi-species call recognizers such as BirdNet are gaining traction, we believe their true potential remains underutilized: ecoacoustics offers a unique opportunity to track the dynamics of entire ecological populations over time.

We illustrate this with a project in Northern Australia, where we deployed SolarBAR continuous acoustic recorders across multiple habitat types for a full year. These recorders captured both invasive species and the bird communities affected by invasives and other threats. We detected over 150 bird species and identified distinct, site-specific acoustic communities. These communities shifted throughout the year, reflecting seasonal migration patterns and behavioral changes in call activity. However, despite dynamics in species call detections, multivariate analysis revealed that each site maintained a unique acoustic signature during any given period.

We argue that these acoustic signatures can be harnessed to track long-term ecological change in response to degradation or restoration. We also encourage ecologists and acoustic practitioners to move beyond a single-species focus and embrace the power of ecoacoustics to monitor entire assemblages and their dynamic shifts in real time.