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Research Article

Modelling habitat quality of high conservation priority vertebrates in an arid ecosystem with limited baseline data

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ABSTRACT

Few arid nations have the baseline data needed to map high value habitat at local scales. We used remote sensing to model local habitat value across Saudi Arabia, an arid nation with degraded ecosystems and limited baseline data. First, we digitally mapped the ranges of Saudi Arabia's 199 high conservation priority terrestrial vertebrate species to produce a Conservation Priority Species Score for every point in the Kingdom. We then used ArcGIS to score five landscape attributes (to 30-m resolution) that correlate with vertebrate occupancy rates in arid ecosystems (urban development, land-use naturalness, hydrology, protected area status, and terrain complexity) to produce a Site Quality Score for every location. By multiplying the broadscale Conservation Priority Species Score by the local Site Quality Scores, we generated a Site Conservation Value Score for every location in Saudi Arabia. Modelled Site Conservation Value Scores correlated significantly with species counts from field surveys conducted at 12 sites, suggesting our model has value. We review the literature from arid ecosystems to test the assumptions inherent in our model and acknowledge the limitations of our approach. These results suggest our interim model can help identify local site value in arid ecosystems until more refined models are generated.

Key words: ArcGIS, Biodiversity conservation, Conservation triage, Protected Areas, Saudi Arabia