

Invasive Ranges of Gorse (*Ulex europaeus*) in South Australia and Sri Lanka Using Species Distribution Modelling

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Abstract : The distribution of gorse (*Ulex europaeus*) plants in South Australia has been modelled using 126 presence-only location data as a function of seven climate parameters. The predicted range of *U. europaeus* is mainly along the Mount Lofty Ranges in the Adelaide Hills and on Kangaroo Island. Annual precipitation and yearly average aridity index appeared to be the highest contributing variables to the final model formulation. The Jackknife procedure was employed to identify the contribution of different variables to gorse model outputs and response curves were used to predict changes with changing environmental variables. Based on this analysis, it was revealed that the combined effect of one or more variables could make a completely different impact to the original variables on their own to the model prediction. This work also demonstrates the need for a careful approach when selecting environmental variables for projecting correlative models to climatically distinct area. Maxent acts as a robust model when projecting the fitted species distribution model to another area with changing climatic conditions, whereas the generalized linear model, bioclim, and domain models to be less robust in this regard. These findings are important not only for predicting and managing invasive alien gorse in South Australia and Sri Lanka but also in other countries of the invasive range.

Keywords : invasive species, Maxent, species distribution modelling, *Ulex europaeus*

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