Global distributions of three highly invasive bird species under climate change

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Abstract

The red-vented bulbul (*Pycnonotus cafer*), the common myna (*Acridotheres tristis*) and the red-whiskered bulbul (*Pycnonotus jocosus*) are passerine bird species native to the Indian subcontinent. All three species were transported widely during the early 1900s as caged birds for trade by Indian workers. They are now considered invasive – occupying diverse habitats, feeding on and damaging a wide range of fruit, and out-compete native fauna. Predicting the current potential global distribution of these species is important to help identify locations where introduction-prevention should be prioritized. Of equal importance is an assessment of how climate change might alter their potential invasive ranges. Here, we used presence data from both their native and alien ranges and eight species distribution model (SDM) algorithms to predict their potential current ranges. We then used five global circulation models and four representative concentration pathways to predict their potential future ranges under climate change. Our results suggest that there is considerable overlap in the potential climatically suitable ranges of the three species, with the common myna having the widest potential range. Many islands, and particularly Mayotte, Madagascar, and the Indian Ocean Islands, appear to be climatically suitable for invasion. Our future projections highlight three locations (Guinea gulf, South America, and Gulf of Mexico) that could be climatically suitable for further invasion by these invasive species and predict potential shifts in the distribution of alien populations in four main geographical areas (Middle East, Australia, and South Africa). We believe that application of SDMs for invasive bird species under climate change scenarios, as used here, can offer managers a useful tool to generate potential-range distribution maps to assess and compare invasion risk at both local and global scales.

Keywords: biological invasions, birds, climate, islands, species distribution modeling

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