Rainfall and topography predict gene flow among populations of the declining northern quoll (*Dasyurus hallucatus*)

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Landscape attributes often shape the spatial genetic structure of species. As the maintenance of genetic connectivity is increasingly a conservation priority, the identification of landscape features that influence connectivity can inform targeted management strategies. The northern quoll (*Dasyurus hallucatus*) is a carnivorous marsupial that has experienced dramatic population declines in recent decades. To inform management of surviving *D. hallucatus* populations across north-western Australia we examined the genetic structure of populations, and identified landscape features that influence gene flow within the Kimberley region. We sampled 249 individuals from 28 populations in three regions of north-western Australia, including the Kimberley, Pilbara and Kakadu. Genetic structuring was evident between the three regions and to a lesser extent between the north and central Kimberley. Landscape genetic analysis of Kimberley populations suggest this structuring may be due in part to the indirect effects of differences in rainfall between these two areas. Also, *D. hallucatus* populations with large areas of open habitat between them tended to be more genetically similar. Managing threats such as the occurrence of intense and frequent fires, and the density of introduced herbivores, could support the persistence of *D. hallucatus* populations, particularly in areas with high rainfall and flat terrain, where greater genetic connectivity confers a better chance of long-term population survival.

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ABSTRACT BOOK