Saving northern quolls: Quantifying the risk of colonisation by cane toads (*Rhinella marina*) on Australia's Kimberley islands

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Coinciding with the invasion of the highly toxic cane toad (*Rhinella marina*), the endangered northern quoll (*Dasyurus hallucatus*) has suffered declines and local extinctions throughout its range in Queensland and the Northern Territory. At least fifteen islands in the Kimberley are important to the future viability of northern quoll populations as they are naturally isolated from mainland threats, including potentially from cane toad invasion. However, islands are susceptible to cane toad invasion; cane toads have been detected on at least 45 Australian islands. Adolphus Island in the mouth of the Ord River in the eastern Kimberley has already been invaded by cane toads, and this island harbours a northern quoll population. Estimating invasion probability is key to effective surveillance strategies, which can reduce impacts of invasions, as well as management costs. Cane toads reach islands through both human-mitigated and natural means such as rafting on debris in freshwater "plumes" ejected from rivers during extreme rainfall events, complicating invasion modelling. By incorporating ocean circulation modelling (OzROMS) and virtual particle-tracking software into predictive models of invasion, we use existing island cane toad invasions to estimate invasion probability attributable to various pathways, including the natural colonisation of islands. We also will predict the island-specific probability of cane toad invasion in future time steps throughout the Kimberley. Our research will help streamline expensive surveillance in a region that is not easily or cheaply accessible by humans in an effort to protect the endangered northern quoll.

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ABSTRACT BOOK