

Investigating avian competition for surface water in an arid zone bioregion

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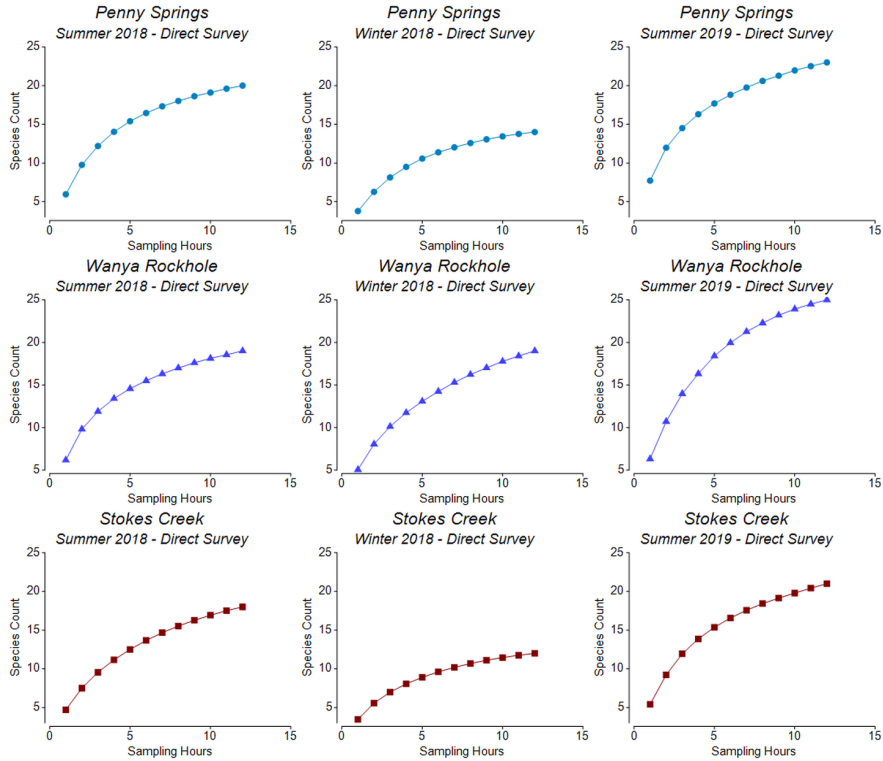
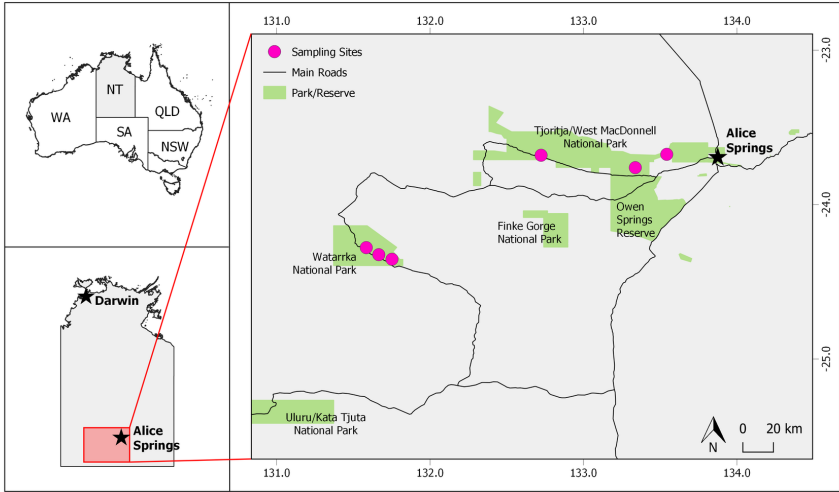
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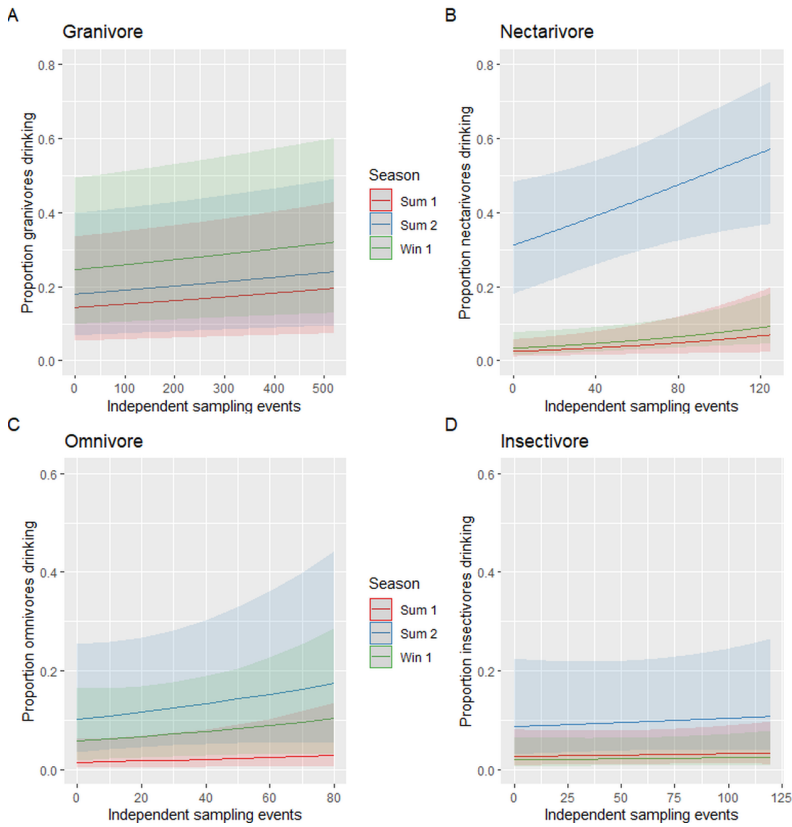
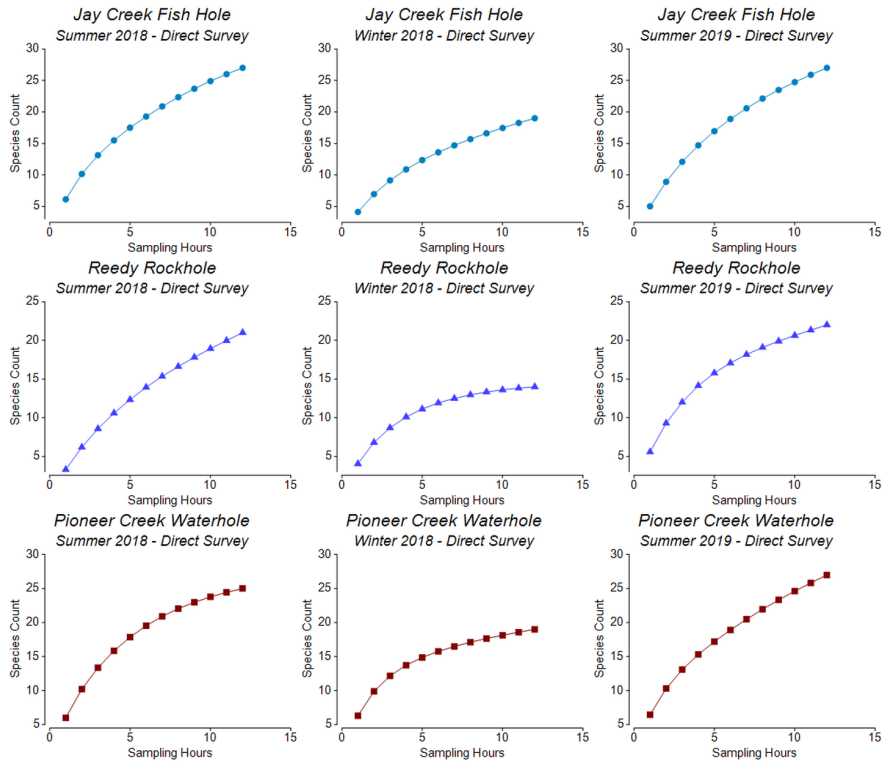
Abstract

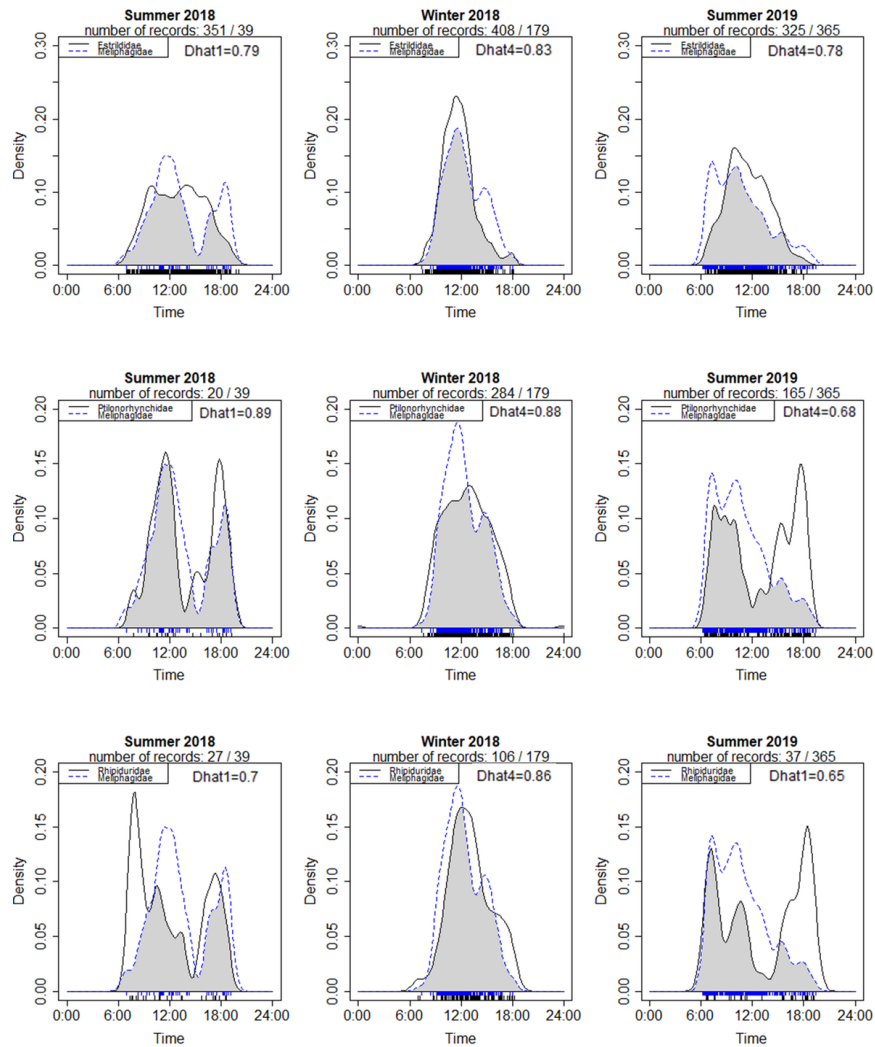
Interference competition has the potential to alter avian assemblages at long-lasting arid zone waterholes, particularly in a warming world, as more potentially aggressive species frequent these sites to drink. We used camera traps and observational surveys to investigate interference competition between terrestrial avian species at six long-lasting waterholes across three sampling seasons (two summers and one winter) within the MacDonnell Ranges Bioregion in central Australia. The proportion of individuals drinking for each of four dietary classes (granivores, nectarivores, omnivores, and insectivores) was modelled in relation to their abundance in the immediate waterhole habitat, which informed the potential for competition in each season. We then used the temporal overlap estimators to quantify the degree of competition between species at waterholes with species grouped into families (Meliphagidae, Ptilonorhynchidae, Estrildidae, and Rhipiduridae). We found the proportion of individuals drinking at waterholes was greatest during hot and dry periods, suggesting the potential for interference competition is greatest during these times. This was particularly the case for nectarivores where, in hot and dry conditions, the proportion of drinking individuals increased significantly as their abundance also increased in the waterhole habitat. We predicted that subordinate species would alter their activity periods to avoid competitive interactions with meliphagids (honeyeaters), however, we found there was a high degree of temporal overlap between all families sampled across all seasons. These results suggest subordinate species are unlikely to be excluded from long-lasting waterholes by potentially aggressive species, such as honeyeaters. However, some species may face trade-offs between foraging and accessing waterholes to stay hydrated as they shift their activity to avoid the hottest parts of the day during the summer months. Under global warming, extended hot and dry periods will likely create conditions where balancing energy and hydration requirements becomes increasingly difficult and results in the loss of body condition.

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Residual diagnostics granivores

