DO DINGOES SUPPRESS FERAL CATS? SPATIAL AND TEMPORAL ACTIVITY OF SYMPATRIC FERAL CATS AND DINGOES IN CENTRAL QUEENSLAND

Bronwyn Fancourt[1,2], Peter Cremasco[1], Cameron Wilson[1] and Matthew Gentle[1]
[1]Pest Animal Research Centre, Invasive Plants and Animals, Biosecurity Queensland, Department of Agriculture and Fisheries, Toowoomba, QLD 4350.
[2]School of Environmental and Rural Science, University of New England, Armidale, 2350.

ABSTRACT

Predation by feral cats (*Felis catus*) is considered to be the most significant factor in Australia's recent mammal extinctions, and is regarded as the factor currently affecting the largest number of threatened and near threatened mammal taxa in Australia (Woinarski *et al.* 2014). Feral cats further threaten livestock, wildlife and human health through the spread of diseases such as toxoplasmosis and sarcocystosis (Dubey 2010; Dubey *et al.* 2015).

The effective control of feral cats, however, is difficult to achieve at the landscape scale using traditional management approaches. Trapping, shooting and exclusion fencing can be effective at local scales, however these approaches are typically time-consuming, expensive and ineffective over larger scales.

Dingoes (*Canis familiaris*) have been proposed as a novel approach to the broad scale control of invasive mesopredators such as feral cats and foxes (*Vulpes vulpes*). However, the ability of dingoes to suppress feral cats and protect species threatened by cat predation remains unresolved.

We used camera traps to investigate the spatial and temporal activity of sympatric dingoes and feral cats across two different land tenures with different management objectives. The "national park" site was located at Taunton National Park, home to the only significant remnant wild population of the endangered bridled nailtail wallaby (*Onychogalea fraenata*). The "agricultural" site comprised three adjoining pastoral stations supporting cattle grazing enterprises. Two replicate camera surveys were performed at each site for a minimum of 21 nights per survey during the 2016 dry season (June to September). For each survey, a total of 90 cameras were deployed across each site, using a combination of on-track and off-track locations.

The presence and activity of cats were both unrelated to dingoes. Species co-occurrence models (MacKenzie *et al.* 2017) revealed that dingoes had no effect on the probability of cat presence on either land tenure. Contrary to predictions, the probability of detecting a cat on the national park was significantly higher in areas occupied by dingoes than in dingo-free areas, while dingoes had no effect on the detectability of cats on agricultural land.

Feral cats and dingoes exhibited marked overlap (Ridout and Linkie 2009; Meredith and Ridout 2018) in both spatial and temporal activity across both sites, indicating coexistence between these predators. Dingoes and cats were active at the same times on the national park site. Some differences in activity times were evident at the agricultural site; however

this reflected shifts in dingo activity times rather than a shift in cat activity. Cat activity times were unrelated to dingo presence or land tenure.

There was no evidence of dingoes excluding cats from any areas at either site, nor was there evidence of any within-night spatiotemporal avoidance of dingoes by cats. Cats remained active, abundant and widespread across the park, with evidence of cats hunting and breeding successfully in areas occupied by dingoes.

Our findings suggest that feral cats can coexist with dingoes, without significant suppression of cat abundance, activity or fitness. Proposals to reintroduce dingoes should be carefully evaluated on a site-by-site basis, as the ability of dingoes to suppress feral cats and protect species of conservation significance will likely be context dependent.

REFERENCES

Dubey, J.P., Calero-Berna,l R., Rosenthal, B., Speer, C. and Fayer, R. (2015). *Sarcocystosis of animals and humans.* (CRC Press: Boca Raton, Florida, USA).

Dubey, J.P. (2010). *Toxoplasmosis of Animals and Humans.* (CRC Press: Boca Raton).

MacKenzie, D.I., Nichols, J.D., Royle, J.A., Pollock, K.H., Bailey, L. and Hines, J.E. (2017). *Occupancy estimation and modeling: inferring patterns and dynamics of species occurrence.* (Elsevier: London, UK).

Meredith, M. and Ridout, M. (2018). overlap: Estimates of coefficient of overlapping for animal activity patterns. R package version 0.3.2.
http://CRAN.R-project.org/package=overlap .

Ridout, M.S. and Linkie, M. (2009). Estimating overlap of daily activity patterns from camera trap data. *Journal of Agricultural, Biological, and Environmental Statistics* 14: 322-337.

Woinarski, J.C.Z., Burbidge, A.A. and Harrison, P.L. (2014). *Action Plan for Australian Mammals 2012.* (CSIRO Publishing: Melbourne).