Mammal Review

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Review

Diet of the introduced red fox *Vulpes vulpes* in Australia: analysis of temporal and spatial patterns

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Abstract

1. The red fox *Vulpes vulpes* is one of the world's most widespread carnivores. A key to its success has been its broad, opportunistic diet. The fox was introduced to Australia about 150 years ago, and within 30 years of its introduction was already recognised as a threat to livestock and native wildlife.
2. We reviewed 85 fox diet studies (totalling 31693 samples) from throughout the species' geographic range within Australia. Mammals were a major component of fox diet, being present in 70 ± 19% of samples across n = 160 locations. Invertebrates (38 ± 26% n = 130) and plant material (26 ± 25% n = 123) were also both staple foods and often the dominant food category recorded. Birds (13 ± 11% n = 137) and reptiles (10 ± 15% n = 132) were also commonly reported, while frogs were scarcely represented (1.6 ± 3.6% n = 111) in fox diet studies.
3. Biogeographical differences reveal factors that likely determine prey availability. Diet composition varied with ecosystem, level of vegetation clearing and condition, and climate zone.
4. Sample type (i.e. stomach versus scat samples) also significantly influenced reporting of diet composition. Livestock and frogs were underrepresented in records based on analysis of scats, whereas small mammals (native rodents, dasyurid marsupials, and bats) were more likely to be recorded in studies of scats than in studies of stomach contents.
5. Diet varied seasonally, reflecting activity patterns of prey species and food availability.

This synthesis also captures temporal shifts in fox diet over 70 years (1951–2020), as foxes have switched to consuming more native species in the wake of successful broadscale biological control of the invasive European rabbit *Oryctolagus cuniculus*.

6. Diet analyses, such as those summarised in this review, capture the evidence required to motivate for greater control of foxes in Australia. This synthesis also highlights the importance of integrated pest species management to meet biodiversity conservation outcomes.

Supporting Information

Filename	Description
mam12251-sup-0001-Supinfo.docx Word document, 400.3 KB	**Appendix S1**. List of studies included in the analyses. **Appendix S2**. Food categories and calculation of frequency of occurrence (FOO). **Appendix S3**. Summary of predictor variables and their covariation.

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