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Feral pig population structuring in the rangelands of eastern Australia: applications for designing adaptive management units

Cowled, B. D., J. Aldenhoven, I. O. A. Odeh, T. Garrett, C. Moran and S. J. Lapidge (2008).

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Abstract

Feral pigs (*Sus scrofa*) are an invasive species in Australia. Their negative impact on conservation values has been demonstrated, and they are controlled in many areas in the rangelands of Australia. However, they are usually controlled over small, often ad hoc management units (MUs), and previous research has revealed that these MUs can be inadequate. Understanding feral pig population structuring can aid in the design of appropriate MUs. This study documents an approach to improving MUs for feral pig control in the rangelands of Australia. Feral pigs from a 500,000 km² region were genotyped with 13 polymorphic markers. Genetic analyses were used to identify population structure. Identified sub-populations were then related to geographical and environmental gradients with geographical information systems, regression analysis and with canonical correspondence analysis. Five sub-populations were identified. These were moderately differentiated, with relatively high-migration rates. Two sub-populations in drier, lower elevation areas overlapped, due to extensive migration, probably along the large, inland rivers and flood plains. Sub-populations in higher rainfall environments appeared less likely to migrate. Sub-population differentiation was also dependant on distance, indicating isolation by distance was present. A case study applying an adaptive MU to a previously controlled area is presented. Generally, however, MUs for feral pig control for natural resource protection and endemic disease eradication in the rangelands should take into account geographical size, but also geographic features, especially major rivers in low-rainfall areas.

Keywords:

Australia; Feral pigs - Population structure - Optimal control - Management units - wildlife endemic disease management.

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