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A pilot study to delimit *tsetse* target populations in Zimbabwe

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*Tsetse* (Glossinidae) are cyclical vectors of human and animal trypanosomoses currently targeted by the African Union, under the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC). Elaborate plans to guide intervention are a requirement if effective control of *tsetse* is to be achieved. A model to aid the planning of intervention programmes and assist a fuller understanding of *tsetse* distribution was applied in a pilot study covering 400 km² in Masoka, Zimbabwe and targeted two savanna species, *Glossina morsitans morsitans* Westwood and *Glossina pallidipes* Austen. Current data were used to study habitat suitability of both species, based on climatic and environmental data derived from MODIS and SPOT 5 satellite images. Factors influencing distribution were explored, using an Ecological Niche Factor Analysis (ENFA), whilst habitat suitability was predicted using a Maximum Entropy (MaxEnt) model at a spatial resolution of 250 m. Area Under the Curve (AUC), an indicator of model performance, was 0.89 for *G. m. morsitans* and 0.96 for *G. pallidipes*. The probability that flies were really absent from grid cells where they were not captured during the study was then calculated, based on a probability model using a risk threshold of 0.05. Apart from grid cells where *G. m. morsitans* and *G. pallidipes* were captured in the study area, there was a high probability of presence in additional grid cells adding up to 128 km² and 144 km² respectively. The modelling process promised to be useful in optimising the outputs of presence/absence surveys, allowing the definition of *tsetse* infested areas with improved accuracy.