Optimising invasive management short of eradication: Predicting settling rules by recolonising American mink post-culling.

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Abstract

Optimising invasive management short of eradication: Predicting settling rules by recolonising American mink post-culling. Many wildlife management programs worldwide seek to reduce the density of invasive non-native species through culling so as to reduce their impact on native biodiversity. In order to succeed, these efforts must overcome compensatory processes and recolonisation by dispersers born in non-controlled areas. The scale and efficacy of dispersal as a compensatory process are poorly known for most species and the focus of much research. The American mink is controlled over nearly 29,000 km^2 by citizen conservationists in Scotland. We used data collected by volunteers to test for joint scale and density dependence in the settling decisions of individuals recolonising culled areas. In order to evaluate the importance of patch quality, conspecific density, distance from natal patch, and sex on settling decisions, we analyse mink movement reconstructed from inferred kinships assignments of genotyped individuals. Emigration appeared density independent, with 77% of individuals dispersing from their natal river section. In contrast, density was the main factor in the choice of location of settlement in male mink, with areas with either high or low density being significantly avoided. In contrast, habitat quality also predicted male settlement and was the main predictor for females'. This provides management optimization of invasive species by predicting patterns of recolonisation, therefore identification of potential attractive sinks.

Keywords: invasive, management, compensation, dispersal, mink

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