

Persistence of Narrow-headed Ant, *Formica exsecta* Nyl. nests at Glenmore Forest over a 10 year period

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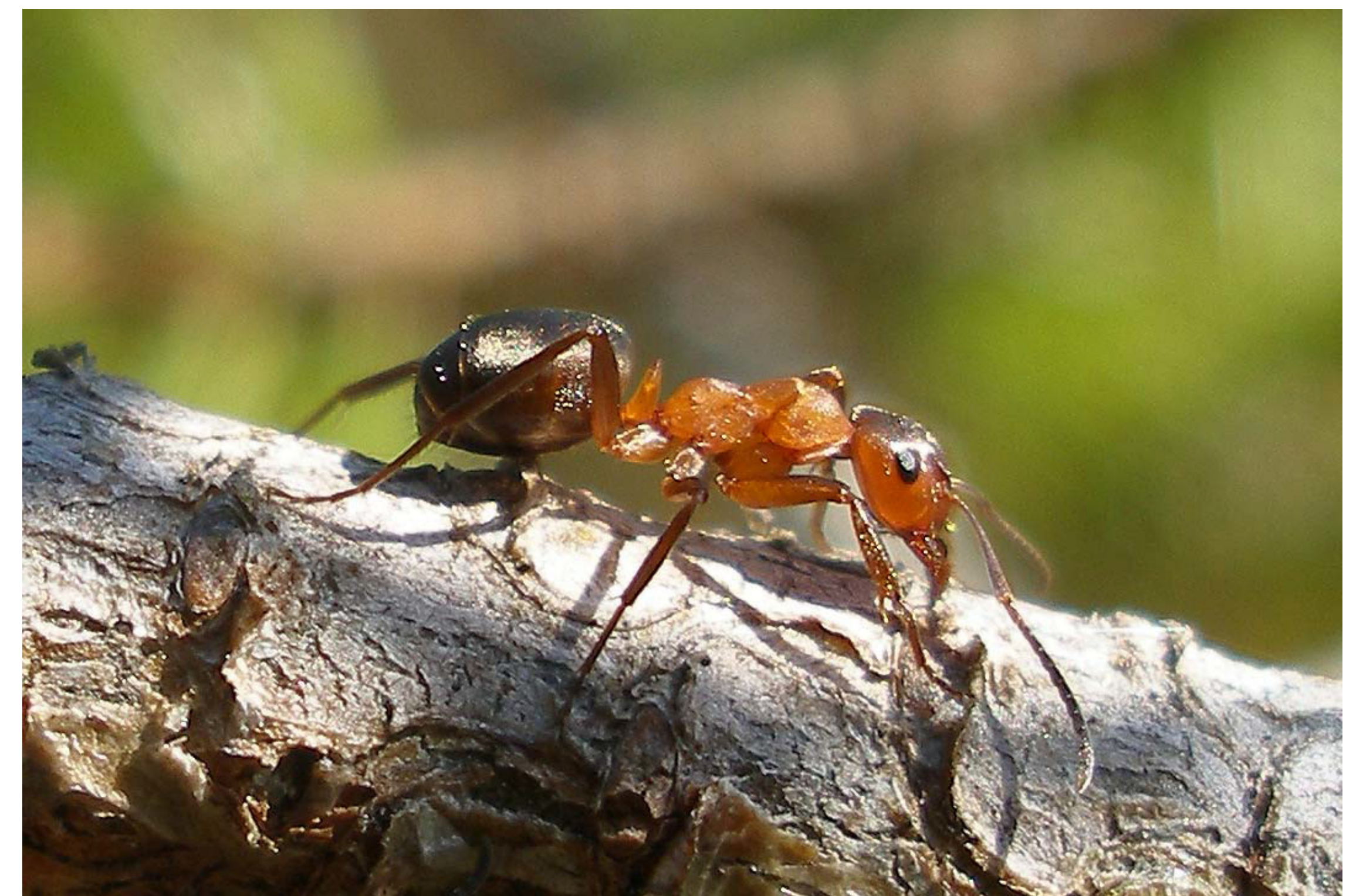
Background

Understanding changes in population and distribution through time is fundamental to conservation, but such data can be difficult to obtain for long-lived species. *F. exsecta* is a Red Data Book 1 species whose UK distribution is restricted to a single site in Devon, and a handful of locations in Inverness-shire, Aberdeenshire and Perthshire. A survey of Glenmore Forest, in Strathspey conducted in 1996-1999 found 430 nests, representing a significant proportion of the known UK population. In 2008 these nest sites were revisited in order to gain an insight into the dynamics of this important *F. exsecta* population.



Methods

Between 1996 and 1999, 430 *F. exsecta* nests were marked with numbered posts. These nest sites were revisited in 2007 and 2008, when 370 of the original markers were re-found. The distance and bearing from marker posts was used to confirm whether active mounds were in the same position as those originally marked, and the area within 5m of the original nest site was searched for new *exsecta* nests. Survivorship at nest sites was analysed in relation to intra-specific density and proximity of neighbouring colonies. Distribution pattern (random, clustered or dispersed) was analysed using the methods of Clark & Evans (1954). Any additional *exsecta* colonies discovered during fieldwork were recorded and mapped.



Key Findings

The total number of known active nests at Glenmore in 2008 numbered 185 whereas between 1996-1999 it was approximately 430 (Figures 1 and 2). A comprehensive survey of the forest is needed to determine to what extent these findings reflect an overall decline in the number of *exsecta* colonies.

Mean annual mortality of nests was 8% (SE±0.5), a figure comparable to that for *exsecta* populations on mainland Europe.

Nests showed a clustered distribution pattern, indicating intra-specific competition is not a dominant ecological force relative to other factors such as life-history traits linked to social structure (e.g. polydomy or dispersal by budding) or habitat patchiness (Figure 3).

Survivorship was not significantly related to nest density, suggesting intra-specific competition is not a governing factor influencing population dynamics at Glenmore Forest.

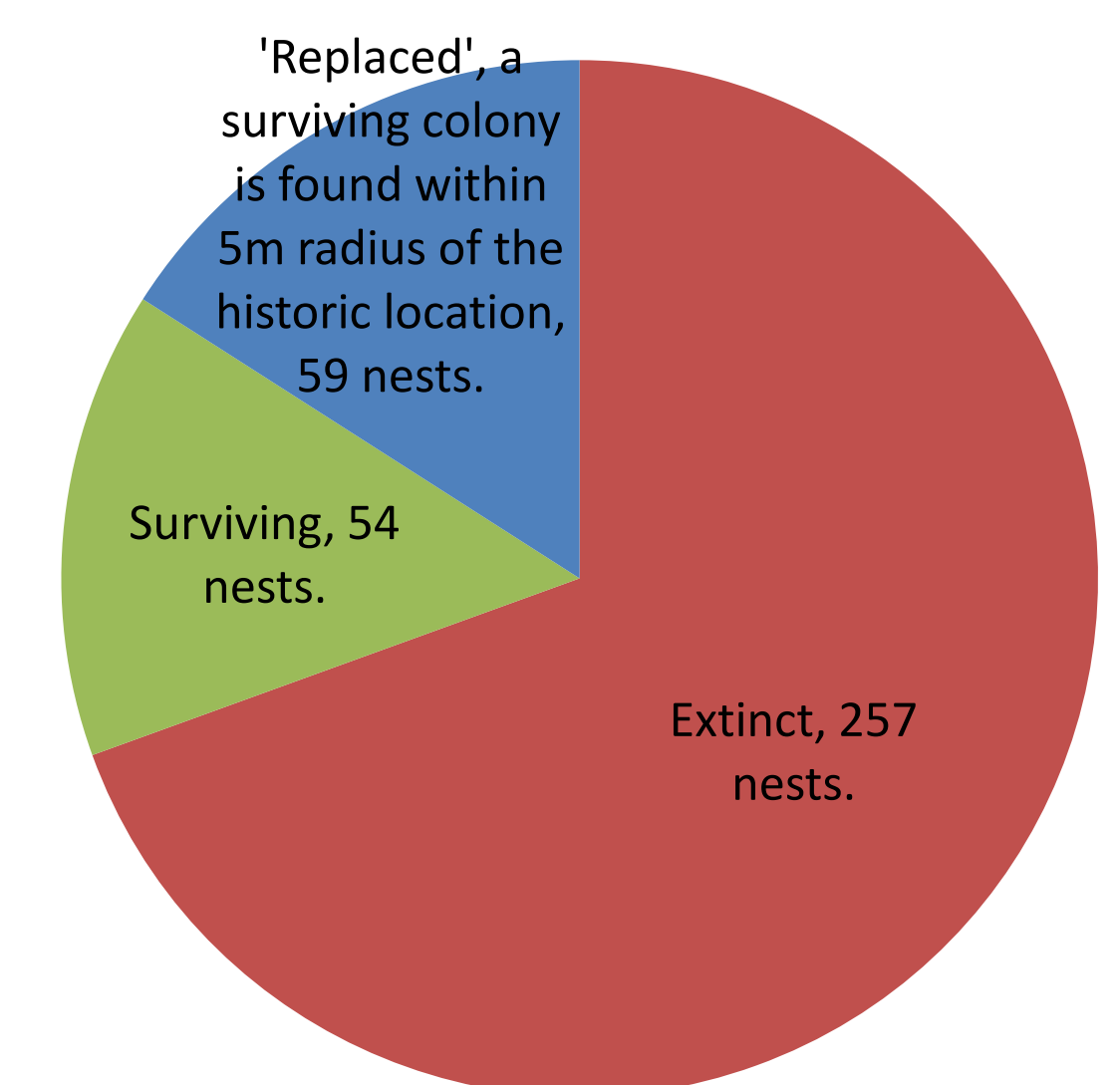


Figure 1: Fate of *F. exsecta* nests after 10 year period

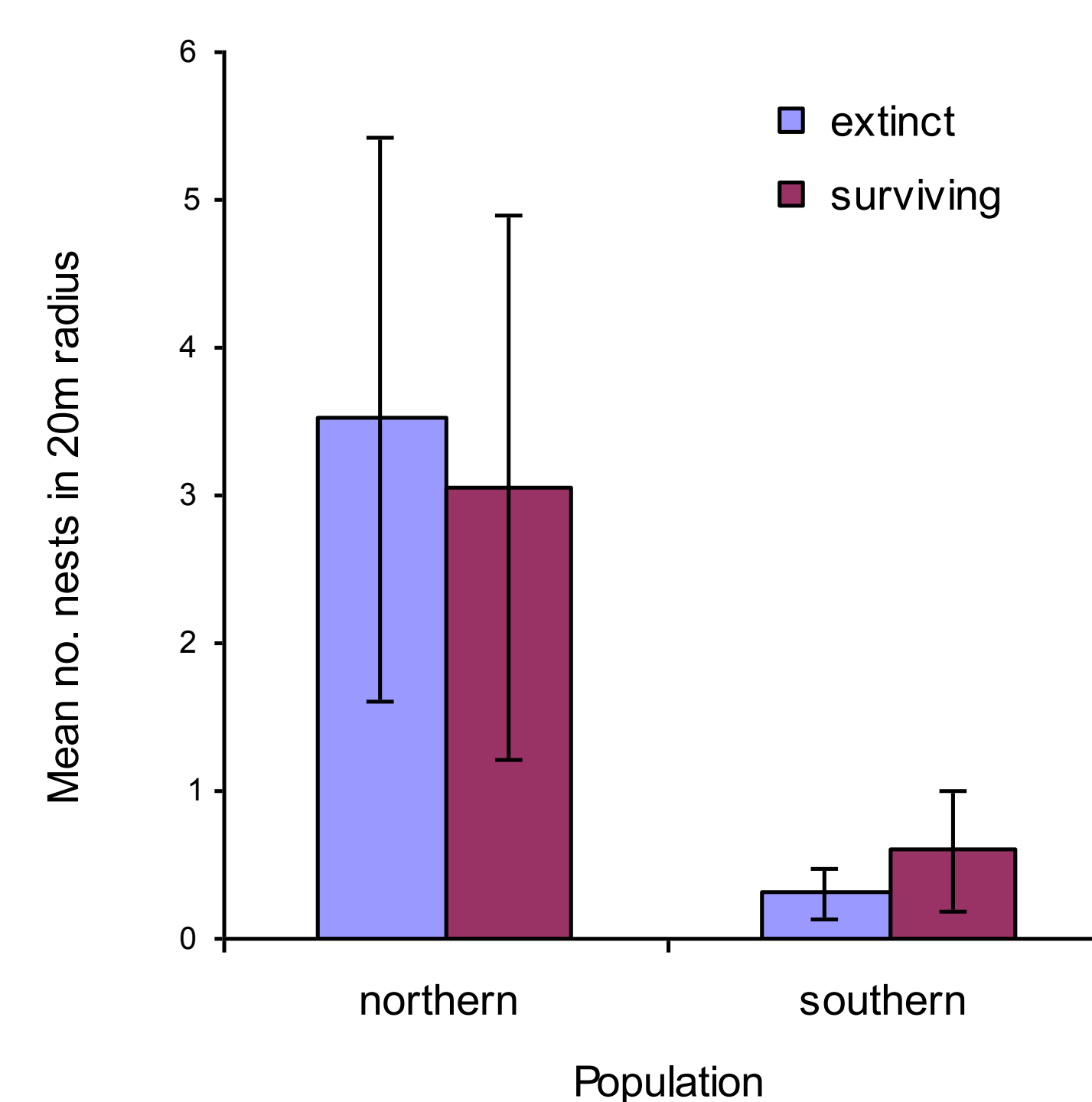


Figure 2: Fate of *F. exsecta* nests after 10 year period

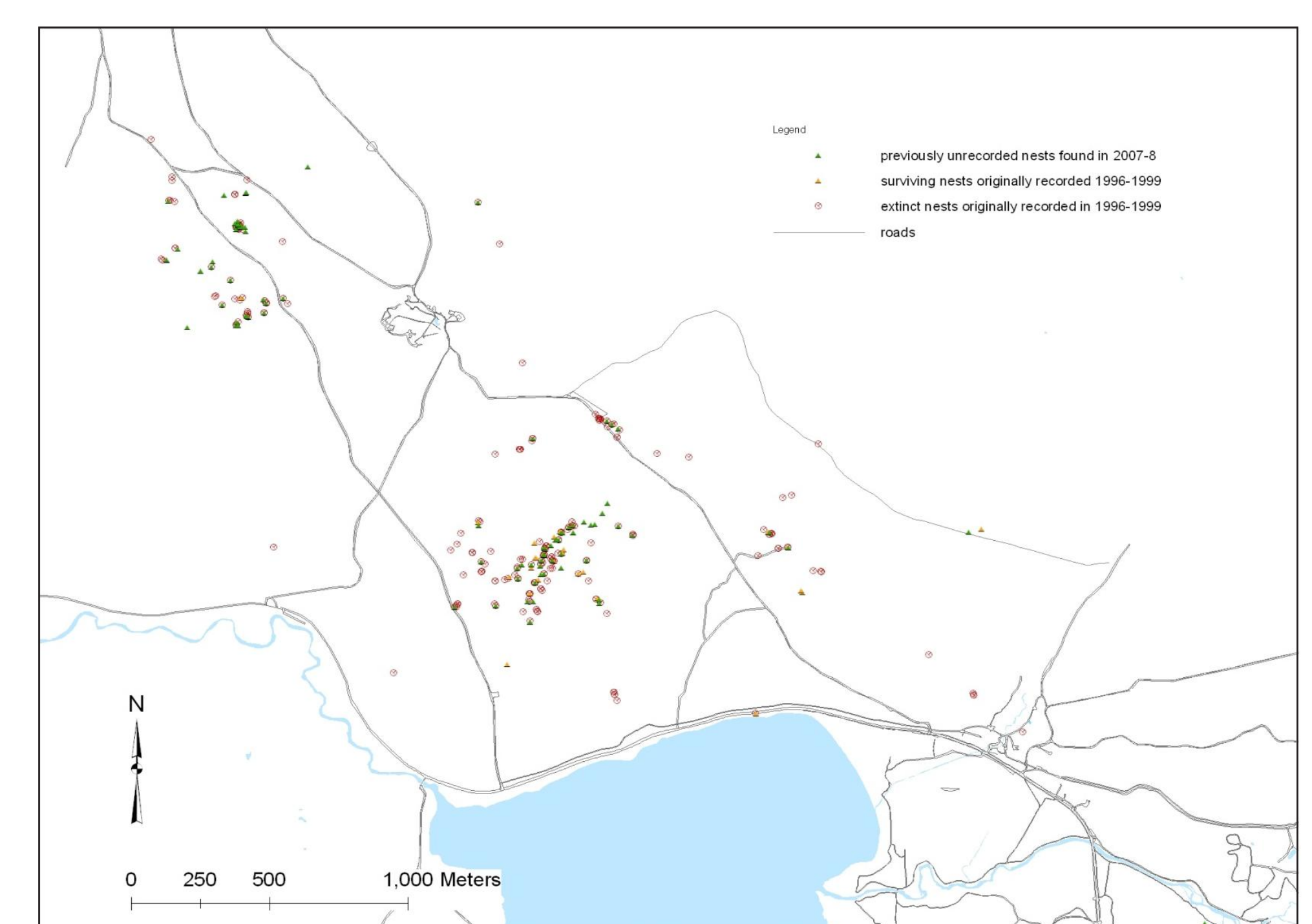


Figure 3: Distribution of extinct and surviving nests surveyed in 1996-1999, and new nests found during 2007-8 resurvey, in the northern part of Glenmore Forest.

Implications and future research

The findings highlight the need for a resurvey of the site and long-term monitoring which takes into account the influence of social structure on effective population size. Of particular concern is the loss of a number of peripheral colonies suggesting the area of habitat occupied by *exsecta* may be shrinking.

Analysis of nest survival with respect to differing forestry management schemes and habitat characteristics would provide valuable insight into appropriate conservation measures for this species. The current dataset could greatly facilitate such analysis at Glenmore Forest.

Acknowledgements

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