INTRODUCTION

Formica lugubris and Formica paralugubris are two sympatric sibling wood ant species found in alpine forest ecosystems. According to the conventional rules of competition (Hutchinson 1957), one of them should be excluded. To elucidate this question, spatial niche partitioning by mesohabitat (25 m²) differentiation is examined on a large sampling scale in the Swiss Jura Mountains through model comparison.

METHODS

Occurrence data (nest number) were collected in the Swiss Jura Mountains (Fig. 1) using a random-stratified sampling design (Table 2). Habitat distribution models were fitted for each species using a set of meaningful GIS environmental predictors (Table 3). Models (GLMs) implemented in a GIS allowed to obtain a potential habitat distribution map for each species (Fig. 2 and 3). Because of the social structure difference, predicted nest densities are represented by unequal classes, fixed on the basis of sampling results.

RESULTS

The two species share very similar habitats, only differentiated by the topographic exposure (TOPO) and the response to the frequency of frost events (SFROYY). They nevertheless exhibit distinct distribution patterns in the study area: F. lugubris and F. paralugubris occur respectively more frequently at woodland borders and into the forest (DRESLIS).

DISCUSSION

The study of wood ant sibling species through a spatial modelling approach allowed to highlight some niche differences, making their coexistence more easily understandable. Patterns and modelling results confirm the hypothesis of a spatial segregation at a local scale. This corroborates the idea of distinct reproductive strategies (dispersal opportunists vs resident specialist). This work is an important contribution to the conservation of near-threatened wood ant species (IUCN red list).

Bibliography
