

Dispersal dynamics of common voles (*Microtus arvalis*) at field-refuge-boundaries

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Common voles (*Microtus arvalis*) can disperse from refuges (e.g. field edges) to arable land and, at high abundances, cause significant losses in agriculture and forestry. To minimise damage it is useful to prevent voles from dispersing to the fields. To apply timely and spatially targeted management methods, sound knowledge about the distribution patterns of voles at field refuge boundaries is required. This study, funded by the German Federal Environmental Foundation (DBU), aims to investigate population dynamics and dispersal patterns of common voles as a basis for a sustainable vole management.

Field sites are located in Saxony-Anhalt, Germany. Grassland areas below wind energy plants, from which common voles invade fields, are used as replicated experimental refuges. To measure dispersal pressure, barrier fences that allow immigration but prevent emigration were installed at some refuges. Since October 2009, population dynamics and dispersal rate from refuges to fields were surveyed

monthly by using capture-mark-release. Recapture probability within each trapping session was at least 50%. In general, extrapolated vole density per refuge averaged 150-300 ind./ha. Mowing in June and September 2010 reduced vole abundance clearly. A population increase in August 2010 as well as in August 2011 led to extrapolated abundances of 850 and 1,300 ind./ha, respectively. During this process, numbers rose higher in refuges without barrier fence than in fenced refuges. Telemetry studies and aerial pictures were used to detect vole dispersal dynamics onto the fields for individuals and on population level. Although there was a low vole density, no establishment of refuge-born individuals could be detected by means of live-trapping. Therefore, it can be assumed that the maximum population density in the refuges is not yet reached. Subsequent DNA analyses on collected tissue samples will allow drawing conclusions about possible migration movements between refuges and fields.