

## GENERAL INFORMATION

<b>author(s)</b>	Dhondt AA, Eyckerman R
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<b>taxa</b>	<i>Parus major</i> , <i>Parus caeruleus</i>
<b>project</b>	long-term study of great tit and blue tit (since 1958 in Ghent, since 1972 in Gontrode)
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## MATERIALS & METHODS

<b>study area</b>	
<b>time period</b>	1960–1978 (1972–1976 for Gontrode, 1976–1978 for experiment 1 in Gontrode)
<b>goal</b>	How strong is competition during the breeding season in different habitats? Does competition during the breeding season influence the size of next year's breeding population? Do great tit and blue tit compete outside the breeding season? How are the dynamics of great and blue tit populations influenced by competition?
<b>set-up</b>	9 different study areas of different suitability for titmice: 6–8 nest boxes per hectare (surplus nest boxes), circular opening of 32 mm (accessible to both great and blue tit) 2 study areas: experiment with 26 mm circular openings (to exclude great tit from roosting sites during winter)
<b>data collection</b>	32 mm nest boxes: breeding season: number of breeding pairs, number of repeat and second clutches, clutch size, number of young fledged, identity of adults – checked once a week 26 mm nest boxes: census of the singing males in spring, census of roosting birds in nest boxes during winter
<b>remarks</b>	For 2 breeding pairs of blue tit, 3 breeding pair of great tit are found, on average (study areas of Dhondt). Great tit reproductive output was significantly reduced by high great tit numbers as well as by high blue tit numbers (Dhondt 1977) due to a reduction in first clutch size (intraspecific effect), an increase in nestling mortality (intra/interspecific effect), and a reduction in the number of birds with a second brood (intra/interspecific effect). The effect of great tit on blue tit was only significant for nestling mortality.

## RESULTS

Competition during the breeding season

- reproductive rate: density of great tit and blue tit negatively correlated with great tit reproductive rate (intra/interspecific competition reduces the great tit reproductive rate), the effect of blue tit density is not significant in areas that are less suitable for blue tit (i.e., with low blue tit densities). Blue tit reproductive rate is not significantly affected by great or blue tit densities.

- size of next year's breeding population: no effect of adult survival rate, significant effect of juvenile recruitment rates (both species), no significant effect of reproductive rate (great tit). Juvenile recruitment rate is also significantly correlated with juvenile survival rate (more important) and reproductive rate (less pronounced). Changes in reproductive rate are affected by the percentage of second broods and nestling mortality, which can both be correlated with food availability. The interspecific competition between blue tit and great tit during the breeding season will affect the numbers of great tit; for blue tit, the impact seems to be very small.

Interspecific competition outside the breeding season occurs for roosting sites and for food.

Great tit numbers are mainly determined by great tit population size at some earlier point in time (intraspecific); blue tit numbers are strongly affected by interspecific competition with great tit.