

Variation in Zugunruhe Timing and Intensity: To achieve a larger and more representative dataset, we included data from all three photoperiods. We separately analysed data from spring and autumn periods. For each timing or intensity metric (e.g., onset, mean, and end dates, duration, mean and peak intensity), we constructed an initial model with population, sex, age, photoperiod, and age \times population interaction as categorical fixed effects and individual bird as a random intercept effect. From this initial model, we manually removed terms that were non-significant. Once a model was solely composed of significant terms, we applied the Tukey method to conduct pairwise tests of significant difference among populations (package multcomp; Hothorn, 2008). When the age \times population interaction was significant (rarely), the multiple comparisons presented in figures use a version of the model without the interaction for clarity and in order to show the overall effect of population. We do describe the interactions in the text when affecting one of the non-hybrid groups (only one case). Similarly, for comparing intensity and duration of *Zugunruhe* between spring and autumn migration periods, we used linear mixed models, beginning with the same fixed and random effects just described and dropping non-significant fixed terms. We manually defined contrasts to test for significance of the effect of season for each population and adjusted for multiple comparisons using the “single-step” option, as above.

Population-wide Nocturnal and Diurnal Activity During the Migration Periods: For each population, we identified the two 60-day periods in the first and second halves of the year with the highest mean nocturnal activity (similar to our procedure for identifying neutral periods) and calculated mean nocturnal and diurnal activity levels for each bird during this period. For each bird, we also used the mean nocturnal activity level for its most active 15-day period in the 60-day window as a measure of peak activity.