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Consequences of demographic processes for genetic drift in house sparrows

Presenting author: **Henrik Jensen**

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Effective population size (N_e) and the ratio between effective and census population size (N_e/N) are important measures of the long-term viability and evolutionary potential of a population because they reflect how fast genetic variation is lost due to genetic drift. Identifying the demographic processes that affect N_e and N_e/N most may therefore improve our understanding of 1) how demography affects drift, and 2) the relative importance of drift and selection for the fixation probability of alleles. In this study we use individual genotype and fitness data from natural house sparrow (*Passer domesticus*) populations in Norway to estimate N_e/N using demographic and genetic methods. We found that demographic N_e/N was most sensitive to demographic variance, especially among older individuals. Also, individual reproductive values (that determine demographic variance) were most sensitive to variation in fecundity. Importantly, genetic N_e/N increased with immigration rates, and genetic N_e were generally much larger than demographic N_e , probably because immigration affected genetic processes more than demographic processes within local populations. Our results suggest that sensitivity analysis is an important tool in linking ecological and genetic processes, and that even low levels of gene flow may have important consequences for the interpretation of genetic estimates of N_e .