Consequences of breeding system for body condition and survival throughout the annual cycle of tidal marsh sparrows

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Abstract

An individual’s body condition and probability of survival can change throughout the annual cycle, based on the combined effects of many factors, including reproductive investment during breeding, colder temperatures during winter, and elevated risks during migration. We evaluated body condition and survival during breeding and non-breeding periods in two closely related species with notably different reproductive systems. Male and female saltmarsh sparrows (Ammodramus caudacutus) represent extremes in parental care: males perform none, leaving females to do everything from build nests to care for fledglings. In contrast, male and female seaside sparrows (A. maritimus) have bi-parental care and similar levels of reproductive investment, intermediate between male and female saltmarsh sparrows. Our results are consistent with the idea that females experience non-lethal effects of reproduction, and that differences between the breeding season and winter affect condition. In both species, females had lower scaled mass index (SMI) values than males during both breeding and non-breeding seasons, and female saltmarsh sparrows had lower SMI values than female seaside sparrows. Females carried more fat than males during the breeding season, and female, but not male, fat and muscle scores decreased over time, which is consistent with the adaptive mass hypothesis. In winter, all groups carried more fat and had higher muscle scores than when breeding, despite having lower SMI scores. Although we observed variation in body condition, within-season survival was uniformly high in both seasons, suggesting that sex, species, season, body size, and body condition have little impacts on within season survival. Comparisons with previously-published estimates of annual adult survival suggest that most mortality occurs during migration, even in these short-distance migrants. The importance of considering multiple aspects of body condition, multiple seasons, and difficult-to-monitor events, such as migration, should not be ignored when thinking about the events and processes that cumulatively determine population dynamics.

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