FROM CRADLE TO EARLY GRAVE: JUVENILE MORTALITY IN EUROPEAN SHAGS IS RELATED TO POOR FORAGING SKILLS

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In most seabirds, the majority of individuals die as juveniles in their first winter. A likely cause is inability to find sufficient food but, until now, no data exist on individual development of foraging in juvenile seabirds from fledging until death. We used miniaturised activity loggers to record daily foraging times of juvenile European shags *Phalacrocorax aristotelis*. Shag parents stopped feeding their chicks about one month after they fledged. From independence, juveniles compensated for poorer foraging abilities than adults by increasing the amount of time spent foraging (by over three hours/day on average), until constrained by shortening day length in early winter. Thereafter, juvenile foraging time tracked shortening day length up to the winter solstice, when foraging time of adults and juveniles converged and continued to track day length until early February. Patterns of juvenile mortality accorded with their foraging performance. Few juveniles in the population as a whole died up to mid-winter, when mortality increased to a peak in January-February, with juvenile mortality rates five times that of adults. n their last two weeks of life, juveniles showed a marked decline in foraging time consistent with individuals becoming moribund. The limitation placed on juvenile foraging time by day length in winter, followed by the coincident decline in foraging time among study juveniles and substantial mortality in the juvenile population, provides the first compelling evidence in seabirds that foraging proficiency of juveniles is a key determinant of survival.