

Where to go during winter? Habitat use does not shape variation in migratory strategies in lesser black-backed gulls

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Optimal foraging theory predicts that individuals strive to minimise their foraging effort, while at the same time maximising their foraging success. Seabirds evolved life histories that involve travelling long distances during their annual cycle, and a large extent of intra-specific variation in migration distance is assumed to be related to spatio-temporal distribution patterns of their food resources. If so, potential costs of migrating over longer distances (e.g. higher energy expenditure and mortality risk, or delayed arrival at the breeding sites) can be expected to be offset by reduced competition, fewer predators or pathogens, or energetically-favourable foraging conditions. We applied long-term GPS tracking data of lesser black-backed gulls breeding in the southern part of the North Sea, to quantify variation in foraging effort between wintering sites. We thereby predicted lower foraging effort with increasing distance from the breeding colony, possibly mediated by differential habitat use. Contrary to our expectations, however, neither habitat use nor foraging effort differed between wintering regions, and individuals that migrated further covered a significantly larger cumulative distance year-round. We hence conclude that migration distance is not offset by a lower daily effort during winter, and that migration strategies in this species are likely shaped by other cost-benefit trade-offs.

Keywords: habitat use; foraging effort; GPS trackers; *Larus fuscus*; lesser black-backed gull