

Flexibility in the bimodal foraging strategy of a high Arctic alcid, the little auk *Alle alle*

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Abstract

A bimodal foraging strategy has previously been described for procellariiform seabird species and is thought to have evolved in response to local resource availability being too low for adult birds to meet chick requirements and simultaneously maintain their own body condition. Here, we examine the dual foraging trip pattern of an alcid, the little auk *Alle alle*, at five colonies with contrasting oceanographic conditions. In spite of large variation in local conditions, little auks at all colonies showed the same general pattern of alternating a single long-trip with several consecutive short-trips. However, we found that the foraging pattern was flexible and could be adjusted at three levels: (1) the length of long-trips, (2) the frequency of short-trips, and (3) the total time spent foraging. Birds facing unfavorable conditions increased the duration of long-trips and reduced the number of short-trips. These adjustments resulted in reduced provisioning rates of chicks despite the fact that birds also increased the time allocated to foraging. Travel times during foraging trips were positively correlated to the total duration of the trip suggesting that differences in trip length among colonies were partly driven by variation in the distance to foraging areas. Most birds spent substantially more time traveling during long compared to short-trips, indicating that they accessed distant foraging areas during long-trips but remained close to the colony during short-trips. However, the difference in travel times was small at the site with the most favorable conditions suggesting that bimodal foraging in the little auk may be independent of the existence of high-quality areas at distance from the breeding ground.

KeyWords: GANNETS MORUS-BASSANUS; THIN-BILLED PRION; PELAGIC SEABIRD; DOVEKIES ALLE; RESOURCE-ALLOCATION; BREEDING SEABIRDS; FOOD AVAILABILITY; DIVING BEHAVIOR; PARENTAL EFFORT; SEX-DIFFERENCES