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Development of chicks and predispersal behaviour of young in the Eagle Owl *Bubo bubo*

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Little quantitative information on the development and behaviour of chicks and young is available for many species, despite the crucial importance of such data and the sensitivity of this stage in a bird's life. For Eagle Owls *Bubo bubo*, despite the large amount of scientific literature on this species, much basic information is lacking. This study provides a photographic and morphometric guide for age estimation of nestlings and fledglings, as well as data on the call behaviour of young, and patterns of movements during the post-fledging dependence period. The most remarkable event in chick development is the rapid increase in mass, and size gain, during the first 30 and 40–45 days, respectively. Because after this time morphometric differences become less evident, young-feather development is more useful for ageing. Patterns of chick call behaviour showed that the time spent calling increased with age and, from 110 days of age, chick vocalizations were usually uniformly distributed through the whole night and most synchronized at sunset and sunrise (the maximum recorded number of vocalizations per chick and per night was 1106 calls). During the post-fledging dependence period, radiotagged Owls moved widely, up to 1500 m from the nest after the age of 80–90 days. During such movements, the mean distance among siblings increased with age, from 168 m on average for juveniles less than 100 days old, to 489 m for those older than 100 days. Definitive dispersal started when young were about 150–160 days old. Information on chick call behaviour and movements is crucial for unbiased census and nest checking, as well as for the definition of young post-fledging areas. Knowledge of the latter is very important in terms of conservation and management (especially for those species that move largely around their nest before dispersal) owing to the high mortality that can occur during this period.

Information on the development and behaviour of nestlings and fledglings is scarce for most species. This is a cause for concern because of the crucial importance of such data for more sophisticated studies, and the sensitivity of this stage in a bird's life (e.g. Lack 1954, Bustamante & Hiraldo 1989, Bustamante & Negro 1994, Amar *et al*. 2000).

Accurate estimate of nestling age is important for (a) investigating several aspects of the life histories of individual species (e.g. Murphy 1981), (b) differentiating between different plumages (e.g. Hill 1987), (c) ageing museum specimens (McCollough 1989), (d) scheduling ringing (e.g. Fyfe & Olendorff 1976), (e) assessing productivity (e.g. Steenhof 1987, Young & Kochert 1987) and (f) backdating hatching data (e.g. Sergio & Bogliani 1999, Marchesi *et al*. 2002, Penteriani *et al*. 2002). With regard to hatching data, and as reported by Sergio (2003) for Black Kites *Milvus migrans*, backdating errors are negligible until some threshold is reached. Such thresholds, which are probably genus- and/or species-specific, are generally unknown, inaccurate or unpublished. In many species, poor nest accessibility, research on sensitive species and conservation concerns may oblige researchers to estimate nestling age from a distance,

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