

# Estimating pre-fledging mortality from ringing data: a proposal

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**Citation: Yates, B.J. 1981. Estimating pre-fledging mortality from ringing data: a proposal. *Wader Study Group Bull.* 33: 1.**

Despite several detailed, long-term studies of breeding waders, there are large gaps in our knowledge of their population dynamics. The greatest ignorance concerns the period from hatching until the first winter, which is probably the period of greatest mortality. It is with this in mind that I propose a method, for discussion, that might lead to a better understanding of population dynamics in waders.

The data exist for a crude ageing of wader pulli into several age groups. If *all* pulli ringed were assigned to an age group, their post fledging recovery rates would reflect the timing of the mortality in that a higher rate of recovery would be expected from those individuals ringed near fledging.

Habitat differences could be investigated by recording where pulli were ringed. Recovery rates of pulli, ringed when very small, are sometimes affected by the ring slipping from their leg. All individuals should be checked for this and even

if any are found to be loose, the ring should be left in place but the fact noted.

In addition to investigating pre-fledging mortality this method will allow the estimation of mortality up to the first winter, by comparison with the recovery rates of individuals ringed as first year in, say, October–November.

This method requires a space on the ringing schedules for recording the information. I suggest that the “brood details” of the BTO schedules could be replaced, for waders, by  $x/y$ , where  $x$  = age group, and  $y$  = habitat code.

The co-operation of all ringers would be required and it would be some time before this method could yield results, but this proposal is in line with the recent policy of the Nature Conservancy Council to increase the effort in studying waders. Comments on this proposal would be welcome.

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## Estimating the pre-fledging mortality of waders: a comment on Yates' proposal

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Yates (1981) has drawn attention to the fact that our knowledge of the mortality of wader pulli is sparse, or non-existent, and proposes that the age and habitat for all wader pulli ringed should be recorded on BTO schedules for later analysis. There should be little difficulty in recording the habitat in which pulli are ringed but such data must be interpreted with caution. It will have to be assumed that the ‘ringing habitat’ is the same as that used by the young during the pre-fledging period. From my experience, this is not necessarily so, especially when pulli are ringed soon after hatching. For example, Lapwings *Vanellus vanellus* in one Peeblesshire colony nested largely on blanket bog, but the young tended to move off the nesting habitat onto adjacent pasture soon (1–3 days) after hatching [Redfern 1982].

Recording the age of a brood or pullus presents a more immediate problem and it might be better to record a measure of the physiological age (e.g. state of development) of the birds, rather than attempting to estimate chronological age

in the field. It can then be left to the analyst to interpret mortality in relation to physiological age. Because growth rates may vary geographically and annually (e.g. Jackson & Jackson 1980) it might be more valid to express pre-fledging



mortality in terms of the mortality relative to the proportion of growth completed, rather than as a chronological age-specific mortality. The weight of each pullus ringed is the best and most useful measurement to record.

The recording of habitat and weight should be obligatory (as far as is possible) for all wader pulli. These data would, as Yates points out, clearly be of value and it is perhaps hard to justify *not* collecting them as a matter of routine.

## References

- Jackson, R. & Jackson, J. 1980. A study of Lapwing breeding population changes in the New Forest, Hampshire. *Bird Study* 27: 27-34.  
 [Redfern, C.P.F. 1982. Lapwing nest sites and chick mobility in relation to habitat. *Bird Study* 29: 201-208.]  
 Yates, B.J. 1981. Estimating pre-fledging mortality from ringing data: a proposal. *Wader Study Group Bull.* 33: 11.

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### **B.J. Yates comments:**

*I agree with most of the comment, by C.P.F. Redfern, on my proposal. However, I still consider bill length to be most suitable in the Redshank *Tringa totanus* (and probably most long billed birds) for assessing age. It shows no post-hatching decline, and is far less variable (therefore, more accurate) than weight. In estimating chronological age it is the physiological age that is estimated and which is then interpreted, for convenience, as time.*

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## Estimating pre-fledging survival rates: a request for information

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Yates (*Wader Study Group Bull.* 33: 11) suggested that pre-fledging survival rates of waders could be determined if pulli were measured when ringed so that their age could be estimated. The principle of the method is simple: a smaller proportion of chicks ringed soon after hatching would be expected to be recovered when full-grown than, say, of those ringed when half-grown, because of intervening mortality. In view of recent successful applications of this method in the Netherlands, I am investigating the feasibility of persuading British ringers to make measurements of wader pulli and of collecting the data efficiently.

Before such a scheme could begin the best set of measurements to make needs to be determined. Bill length, head-and-bill length, tarsus, wing and weight are all candidates. The method of measurement also needs to be specified, e.g.

are measurements with rulers acceptable or must vernier callipers be used. The accuracy of the measurement for the determination of age is obviously important but there are other important considerations. To be successful the scheme would need to coax the vast majority of ringers to co-operate. Therefore measurements which are difficult to make or which require special instruments will be avoided (even vernier callipers may be "special instruments" to many). I would be very grateful for any comments on the relative merits of different measurements, or on other aspects of the scheme. Any ringers who are likely to catch wader pulli of known age in 1984 and who would be prepared to try out some measuring techniques on them are urged to contact me as soon as possible.

