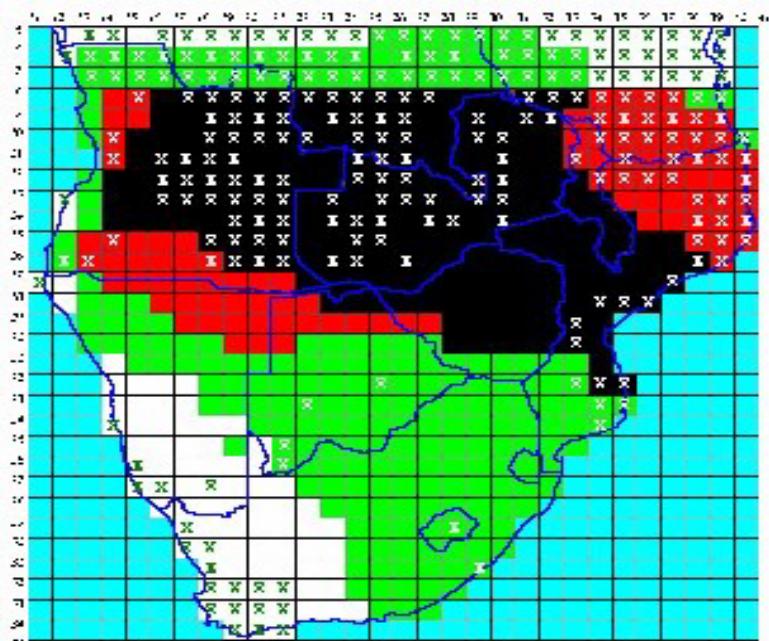


## Quelling the Quelea Birds

The red-billed quelea bird, *Quelea quelea lathamii*, sometimes known as the 'feathered locust', is a major pest of small-grain cereal crops throughout semi-arid areas of Africa, attacking millet seed heads, mature sorghum seeds and other crops. A CPP project on quelea (R7967) has devised a prototype model to predict where and when populations of quelea bird are likely to breed. Forecasts will help the control teams in southern Africa to identify where and when crops are likely to be damaged and to target their operations against nesting colonies more effectively. Hitherto, such planning has been difficult, as quelea birds are long-distance migrants, moving up to 2500 km, in response to the seasonal movements of rain-fronts. The onset of rain at the start of the wet season causes their main food, grass seeds, to germinate, forcing birds to perform an 'early rains migration' away from their dry season quarters. Over the following 3–4 months the birds then undertake further 'breeding migrations' to areas where adequate rainfall will permit them to breed. These further migrations were previously unpredictable, and the model uses rainfall estimates to assist with prediction.

The model was programmed in a spreadsheet package and its output disseminated as colour-coded maps, scaled according to a grid of one-degree squares. During 2001/2002, the model was run on a weekly basis throughout the wet season (September to May inclusive) in southern African. It relies on rainfall estimates derived from cold cloud duration (CCD) data collected from the Meteosat satellite. During the model runs, each square was allocated a colour according to one of four possible conditions (see model). The output maps were superimposed with information on squares where quelea had bred in the past (and hence the habitat was suitable) or where they had never been recorded at all (where the habitat is presumably hostile to them).

In 2001, the model predicted that the early rains migrations started simultaneously at opposite ends of the quelea geographical range, i.e. Angola and south-eastern South Africa. By mid-November, the model was predicting that the birds would have been concentrated into restricted parts of Botswana and into areas of Zimbabwe, South Africa and Mozambique adjacent to where their borders meet. The model was broadly consistent with observed events, insofar as these are known at present, but may have underestimated activity in southern Botswana and South Africa. Research is underway to improve the model as a promising tool in the quest to quell the quelea menace!



- Insufficient rain has fallen to permit activities associated with the start of a quelea breeding season
- Sufficient rain (>60 mm) has fallen to allow grass seed germination forcing birds to initiate the early rains migrations away from that square
- Six weeks have passed since condition 2 started and sufficient rain (>300 mm) has fallen during the preceding five weeks to allow breeding to occur
- Breeding is unlikely as more than five weeks have elapsed since breeding became possible
- X Never been any records of *Quelea quelea lathamii*

*Example of model output for week ending 11 February 2002*

**R7967:** Forecasting movements and breeding of the Red-billed Quelea bird in southern Africa and improved control strategies

**Contact:** Bob Cheke, Natural Resources Institute