

DO NATURE RESERVES PROTECT PASSERINES FROM POPULATION DECLINES SIMILAR TO THOSE IN THE WIDER COUNTRYSIDE?

It might be supposed that nature reserves would protect birds from the population pressures that are found in the wider countryside. However ringing results from Wicken Fen NNR show that the changes in populations of certain passerines have mirrored the trends shown by the BTO's consolidated population monitoring.

The Wicken Fen Group has been ringing birds at Wicken Fen since 1968. Wicken Fen is a site of mixed wetland habitats: aquatic, reed-bed, sedge, litter, carr and woodland (Friday 1997), of these the reed-bed, carr and woodland hold the main populations of passerines and are the areas where the Group's ringing has been directed.

Throughout the period 1969 to present, apart from four standardised sessions each summer, the Group has largely been ringing birds in the random way that is characteristic of most ringing operations.

Given the duration of the operation it is possible to make a comparison of the number of certain species of birds ringed each year to provide an indication of trends in populations using data from 1969-2010 and to compare them with national trends.

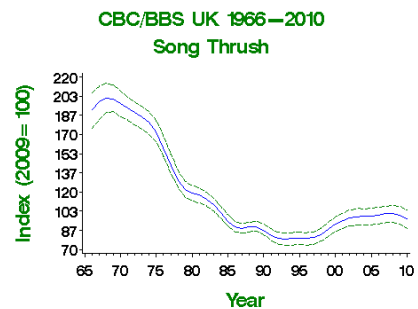
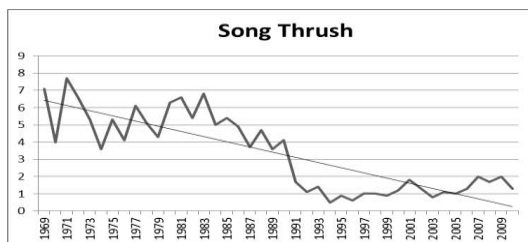
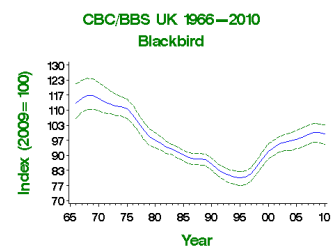
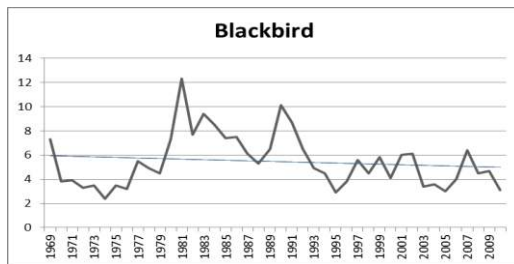
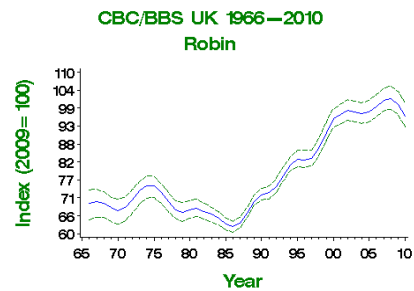
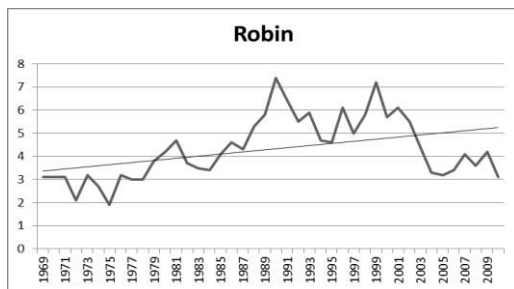
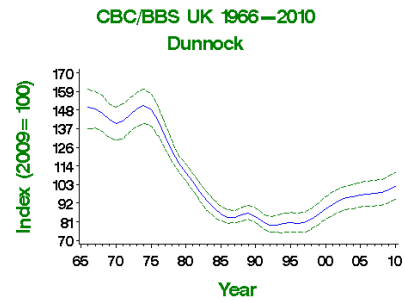
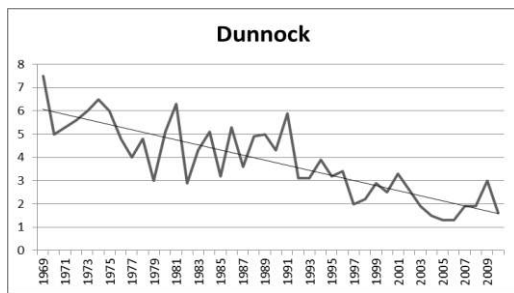
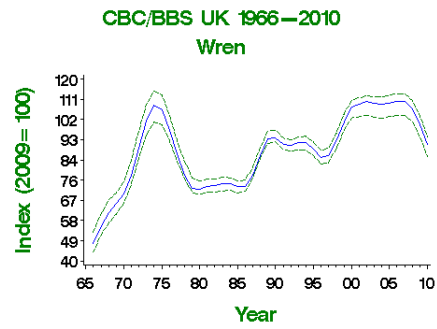
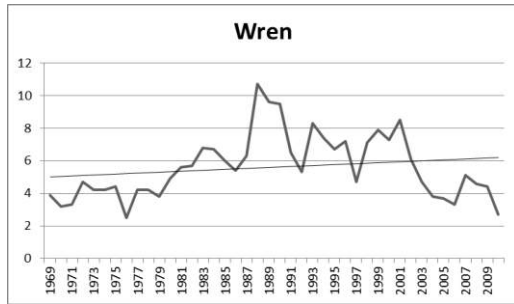
Source of the figures

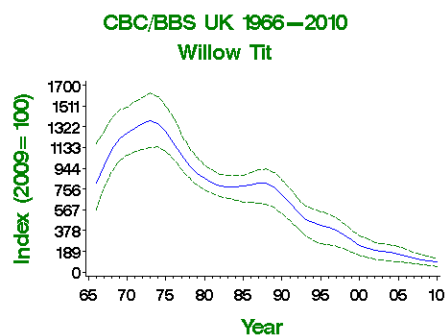
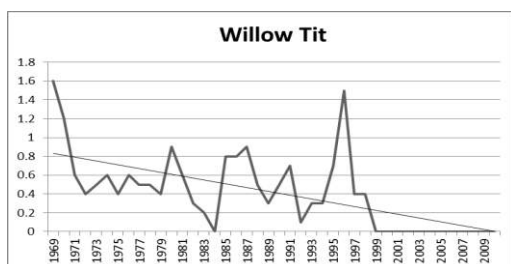
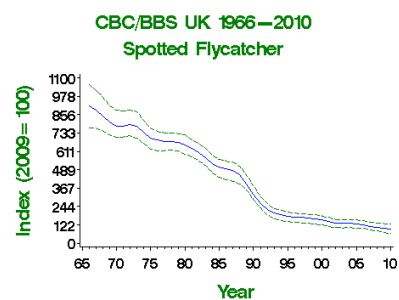
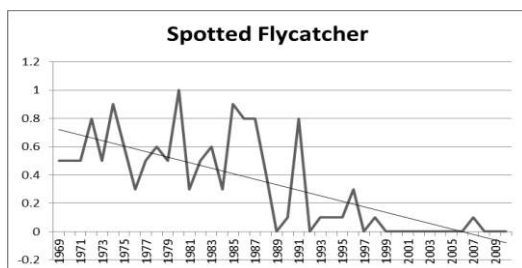
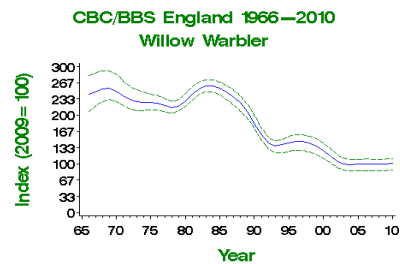
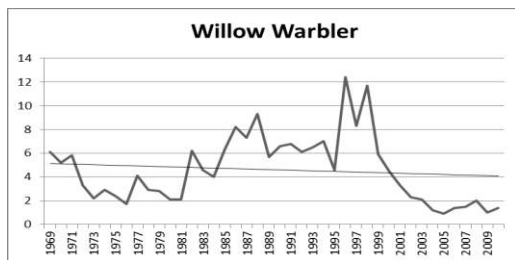
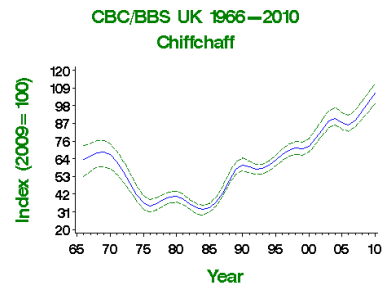
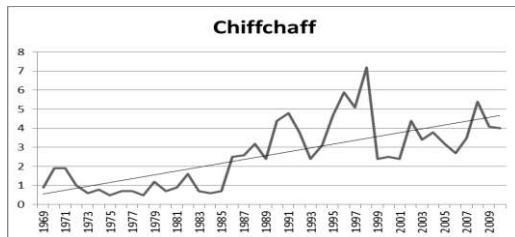
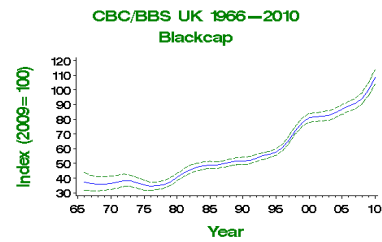
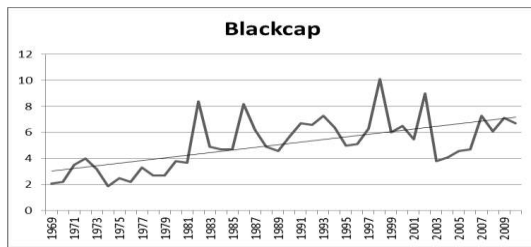
Using a simple method of calculating Relative Abundance, the figures were arrived at by dividing the annual number of a given species ringed by the total number of all birds ringed in that year multiplied by 100.

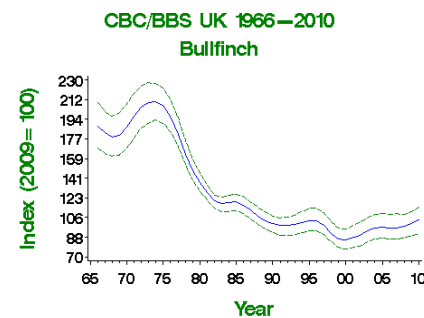
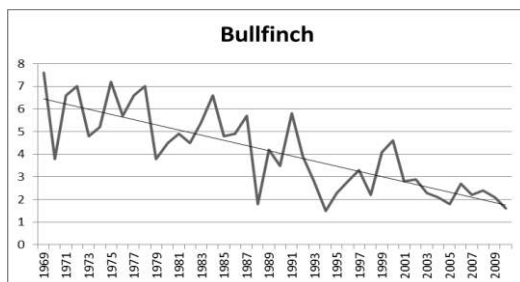
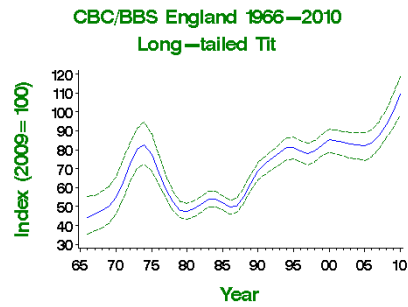
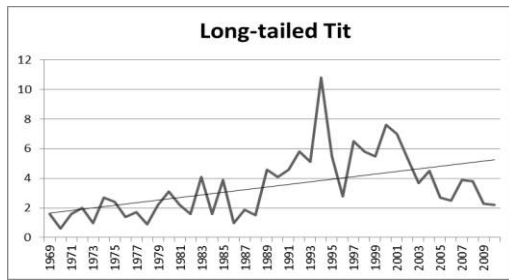
Only those species that have been caught without any specific luring or directed catching attempts have been included in this analysis.

Population trends

The results of the analysis for twelve species appear in a series of figures below. In addition the BTO trends are presented alongside for comparison.







Discussion

These figures, both the increases and declines, show remarkable similarity to those from BTO's national trends, which suggests that Wicken Fen is subject to the same passerine population pressures that have been reported from the wider countryside (Fuller et al 1995, Newton 2004). This is surprising since the site, as a National Nature Reserve (NNR), is managed sympathetically for birds. Newton (2004) listed habitat changes and consequent decrease in, or loss of, food supply as the main factors in the decline of species such as those in this analysis. While Wicken Fen is a semi-natural oasis within an area of open intensively-farmed arable land where natural features such as hedgerow, tree belts and copse are at best sparsely distributed, or worse, non-existent, there has been little discernable change in the fenland countryside over this period of time. Habitat change seems, therefore, unlikely to be responsible. Possible causes, namely other changing farming practices such as the extensive use of agro-chemicals and autumn replanting seem more likely culprits. The greatest rate of decline is shown by the Tree Sparrow *Passer montanus* from a relative abundance figure as high as 11.1% in 1970 to zero by 1991 (and for several subsequent years); similarly Reed Bunting *Emberiza schoeniclus* from a mean relative abundance of 9.1 (SE +/-0.92) in the ten years 69-78 down to a mean of 0.81 (SE +/-0.2) in the ten years 1989-98.

Two other species, Spotted Flycatcher *Muscicapa striata* and Willow Tit *Poecile montanus* have declined to zero but in both cases from a low starting point and possible causes

have already been debated (e.g. Fuller et al 2005, Lewis et al 2009) Changes specific to Wicken Fen include evidence of long-term drying out, also a loss of under-storey in the Wicken carr and woodland as a result of significant increases in deer numbers.

Declines to a lower, but now stable population include Song Thrush *Turdus philomelos*. In the first ten years of ringing Song Thrush had a higher mean relative abundance (5.5% +/-0.43) than Blackbird in the same period (4.1% +/-0.45). Dunnock *Prunella modularis*, showed a large decline, Bullfinch *Pyrrhula pyrrhula*, too. The trend line in the figure for the Willow Warbler *Phylloscopus trochilus* presents a rather optimistic view, close inspection shows a recent sharp decline, again reflecting the situation nationally.

Wicken Fen also reflects increasing populations of: Wren *Troglodytes troglodytes*, Robin *Erithacus rubecula*, Blackcap *Sylvia atricapilla* and Chiffchaff *Philoscopus collybita*, Long-tailed tit.

Cautionary note

Use of these data must be accompanied by a note of caution. Over a period this long there is inevitably inconsistency of effort (net/man/hours) and variability of weather conditions. Furthermore since ringing takes place at Wicken more or less throughout the year, these data have not been subdivided for season and although winter effort has historically been much less than summer, the Relative Abundance figures show overall population and not just breeding population (unlike the BTO figures). They also show adults and juveniles combined and they do not include birds retrapped in that year that had been ringed in a previous year and so do not reflect the total known population.

Summary

Using an unsophisticated analysis, the ringing data at Wicken Fen NNR, suggest that for certain species the population trends closely match those reported nationally despite the fact that the site is a National Nature Reserve and that both the Fen and the surrounding countryside do not appear to have changed significantly over the study period. Is this the case at all nature reserves?

Peter Bircham

ACKNOWLEDGEMENTS

Thanks are due to the many members of the Wicken Fen Group over the period 1968-2010 who have in some way contributed to the gathering of the data used in this analysis. Particularly I would like to thank Chris Thorne and Michael Holdsworth for their suggestions in the preparation of this paper. Also the National Trust staff who have

supported the work of the Wicken Fen Group with consideration and encouragement over the whole period.

REFERENCES

Friday, L.E. (1997) *Wicken Fen the making of a Wetland Nature Reserve*. Harley Books.

Fuller, R.J., Gregory, R.D., Gibbons, D.W., Marchant, J.H., Wilson, J.D. & Carter, N. (1995) Population declines and range contractions among lowland farmland birds in Britain. *Conserv Biol* **9**: 1425-1441

Fuller, R.J., Noble, D.G., Smith, K.W., & Vanhinsbergh, D. (2005) Recent declines in populations of woodland birds in Britain: a review of possible causes. *Brit Birds* **98** 116-143

Lewis, A.J.G., Amar, A., Charman, E.C., & Stewart, F.R.P. (2009) The decline of the Willow Tit in Britain. *Brit. Birds* **102**: 386-393

Newton, I. (2004). The recent decline of farmland bird populations in Britain: an appraisal of causal factors and conservation actions. *Ibis* **146**: 579-600