BTO Research Report No. 85

REPETITION OF HISTORICAL (PRE-WAR) SURVEYS PROJECT FEASIBILITY STUDY

by

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November 1991

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A report on research carried out by the British Trust for Ornithology as part of the work programme specified within the BTO/Joint Nature Conservation Committee contract.

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EXECUTIVE SUMMARY

1.A study of the feasibility of repeating the first quantitative ornithological surveys in Britain (in order to gain information on long term population trends) was carried out in accordance with the Research and Surveys Committee Forward Plan (Project 6.12 in the Appendix to the BTO/JNCC contract).

2.A total of 20 surveys carried out between 1909 and 1951 were assessed as to whether they fulfilled 5 requirements identified as prerequisites for successful repetition.

3.Information was drawn from the original publications and the archives of both the BTO and the Edward Grey Institute, Oxford.

4.It was concluded that the majority of studies failed to fulfil one or more of the 5 requirements and therefore could not be repeated in a manner which would produce meaningful results.

5.Four surveys were identified as having good potential for repetition. Three of these comprised a long term study of the afforestation of the Brecks by David and Elizabeth Lack. The fourth was a comparison of 'industrial' and 'rural' farmland in Wales, by Bruce Campbell.

6.As a result of this feasibility study it is clear that the aims of the project as originally conceived cannot be fulfilled and it is recommended that the project be discontinued. The two studies by Lack & Lack and Campbell should be considered as candidates for continuing case studies.

1. INTRODUCTION

During the early part of this century the first attempts were made to collect quantitative data on bird populations in a systematic manner. These surveys were carried out by a number of different amateur ornithologists working in a variety of habitats and the results of several of the surveys have been published. In a project proposal, written by R.J. Fuller in October 1990, it was suggested that repetition of these historical censuses may provide a unique source of quantitative information on changes in diversity and abundance of bird communities in Britain. It was always recognised in the proposals, that the feasibility of the project would depend upon the quality and availability of information concerning the study sites, methods and results. This report details the outcome of exploratory research designed to assess the feasibility of the project.

2. METHODS

Whether a survey can be repeated in a meaningful matter depends upon several factors. Most of these concern the availability of adequate information about the study sites, methodology and results. Five factors were identified as being prerequisite for the successful repetition of a survey:

a)If the boundaries of the study site(s) can be identified in sufficient detail.

b)If the study site(s) still exist in the same state as when surveyed (for instance many heathlands and farmlands will have been built on).

c)If the methods have been recorded in sufficient detail to allow them to be repeated precisely.

d)If the original raw data still exist (as in order to draw conclusions it is necessary to be able to assess the variation in count data and to be able to test any apparent differences for statistical significance).

e)If the sample size (in terms of the number of birds recorded) of the original survey is sufficiently large to allow valid statistical comparisons between years.

A total of 20 surveys were identified as possibly worth repeating. Each of these was examined as to how well it fulfilled each of the above five requirements. Information was sought from the following sources; the original publications themselves, the archives of the BTO and the archives of the Edward Grey Institute Library, Oxford. When all the information had been collated, the potential worth of repeating each study was graded on the following scale; None, Poor, Fair, Good.

3. RESULTS

In the following list, the original publication for each survey is given, together with a precis of the contents. How well each survey fulfils the five prerequisites is examined and the potential of the survey for repetition assessed. The original surveys have been grouped according to habitat.

3.1 Farmland

3.1.1Alexander, W.B. 1932. *The bird population of an Oxfordshire Farm.* J.Anim.Ecol. 1:58-64.

Comments: Study site: Temple Farm, Oxford, c. 300 ac. Sketch map in BTO archives (Thetford). Area partially built on in 1936 (Chapman 1939). No Temple Farm shown on modern O/S map. Have made site visit and Temple farm appears to have become the Templar Caravan and Country club. Methods not very rigorous-can't replicate with confidence. Methods not given for winter counts. Counts for 1927-31; 5 winters & 3 summers. Individual birds counted in winter, nests (pairs) in summer.

SITE BOUNDARIES IDENTIFIED?: sketch map in BTO archives. SITE EXISTS?: No. METHODS: poor, badly described. ORIGINAL DATA: yes. SAMPLE SIZE: O.K.

Potential: NONE.

3.1.2Chapman, W.M.M. 1939. *The bird population of an Oxfordshire farm.* J.Anim.Ecol. 8:286-299.

Comments: Study site as above + additional area of about 125 ac. Methods better than Alexander's study and repeatable (beating in winter, mapping in summer). According to the publication, the original counts are with the EGI (not BTO) but they could not be found. Survey carried out between 1931 and 1935.

SITE BOUNDARIES IDENTIFIED?: No, but may be able to use sketch map above. SITE EXISTS?: No. METHODS: O.K. ORIGINAL DATA: not yet found. SAMPLE SIZE: O.K.

Potential: NONE.

3.1.3Campbell, B. 1953. *A comparison of bird populations upon 'industrial' and 'rural' farmland in south Wales.* Trans.Cardiff Naturalists Soc. 81:5-65.

Comments: Good study. Used 8 paired 100 ac. blocks. Maps provided in paper are inadequate, but exist in detail in original thesis. Methods good and repeatable (walking, beating & territory mapping). Only problem is that study years were 1944-47 & encompass the severe winters of 1944/5 & 1946/7.

SITE BOUNDARIES IDENTIFIED?: In thesis. SITES EXIST: ? Some probably now

developed. METHODS: Good. ORIGINAL DATA: In thesis. SAMPLE SIZE: Good.

Potential: GOOD.

3.1.4Lister, M.D. n.d. *The bird population of a Surrey Farm.* Unpubl. MS.

Comments: Whereabouts of MS unknown. Not at EGI.

Potential: POOR.

3.1.5Maynard, V. 1936. *The bird population of an area in Sussex.* J.Anim.Ecol. 5:312-318.

Comments: Good map of farm provided in paper. About 20 ac. surveyed in summer 1934-35 (nest finding) and monthly counts also given. Methods poorly described but could possibly recreate breeding survey. Total of 39 pairs and 14 species.

SITE BOUNDARIES IDENTIFIED?: Yes. SITE EXISTS?: Still on map. METHODS: Not very good. ORIGINAL DATA: Sufficient for summer survey. SAMPLE SIZE: Poor.

Potential: POOR.

3.2 Downland

3.2.1Venables, L.S.V. 1939. *Bird distribution on the South Downs and a comparison with that of the Surrey Greensand Heaths.* J.Anim.Ecol. 8:227-237.

Comments: No fixed study site, just walked areas of similar habitat. Methods inadequate (no. birds/linear mile).

SITE BOUNDARIES IDENTIFIED?: No. SITES EXIST?: Probably. METHODS: Poor. ORIGINAL DATA: No. SAMPLE SIZES: O.K.

Potential: POOR.

3.2.2Colquhoun, M.K. & Morley, A. 1941. *The density of downland birds.* J.Anim.Ecol. 10: 35-46.

Comments. Study site "the Berkshire Downs". Counts in winter & summer. Used line transects, taking into account 'detectability' Counted no. seen/linear mile x index of conspicuousness.

SITE BOUNDARIES IDENTIFIED?: No. SITES EXIST: Probably. METHODS: poor. ORIGINAL DATA: No. SAMPLE SIZE: O.K.

Potential: POOR.

3.2.3Thomas, J.F. 1932. *Census of the bird population of a portion of the South Downs near Seaford, Sussex, 1927-1932.* Unpubl. MS. EGI, Oxford.

Comments: Sketch map with description of boundaries; about 153 ac. typical walk route described. Approx 5 counts per month for 41 months. Good study, well written up. All birds located visually since he was deaf!

SITE BOUNDARIES IDENTIFIED?: Yes. SITE EXISTS?: Probably. METHODS: Repeatable. ORIGINAL DATA: Yes. SAMPLE SIZE: O.K.

Potential: GOOD

3.3 Heath/Downland

3.3.1Lockley, R.M. 1935. *A census over seven years on Skokholm,* **Pembrokeshire.** J.Anim.Ecol. 4:52-57.

Comments: No map but should be able to work out area fairly precisely. 220 ac. surveyed. Non-heathland species excluded. Summer counts in years 1928-34 inclusive. (Winter counts 1927-32 but no methods given).

SITE BOUNDARIES IDENTIFIED?: No, but almost all of the island covered. SITE EXISTS?: Yes. METHODS: O.K. ORIGINAL DATA: Yes. SAMPLE SIZES: O.K. (112 pairs, 10 species).

Potential: GOOD.

3.3.2Lack, D. & Venables, L.S.V. 1937. *The heathland birds of South Haven Peninsula, Studland Heath, Dorset*. J.Anim.Ecol. 6:62-72.

Comments: Map in text. Surveys in summer 1935/6 and winter 1935. Methods could be replicated. Sample sizes very small (only 3 species involved in summer).

SITE BOUNDARIES IDENTIFIED?: Yes. SITE EXISTS: Yes. METHODS O.K. ORIGINAL DATA : In Paper. SAMPLE SIZE: Poor. (28 pairs, 10 species in summer 1935).

Potential: POOR.

3.3.3Lack, D.1935. *The breeding bird population of British Heaths and Moorland.* J.Anim.Ecol. 4:43-47.

Comments: 16 sites/observers. No maps, 3 methods. Sample sizes often extremely small. As it is; useless (but see J.F. Thomas on downland). May be able to do Lundy? Nothing in EGI.

SITE BOUNDARIES IDENTIFIED?: No. SITES EXIST?: Some. METHODS: various. ORIGINAL DATA: No. SAMPLE SIZES: Often Poor. (11 sites had <9 species and < 50 birds)

Potential: POOR.

3.3.4Venables, L.S.V. 1937. *Bird distribution on Surrey Greensand heaths: the avifaunal-botanical correlation.* J.Anim.Ecol. 6:73-85.

Comments: No study sites specified. Methods mixed; no attempt to measure a population at a given site, more a comparison of species composition at different ages of heathland.

SITE BOUNDARIES IDENTIFIED?: No. SITES EXIST:? METHODS: No. ORIGINAL DATA: No. SAMPLE SIZE: N/A.

Potential: NONE

3.4 Breckland/Plantation

3.4.1Lack, D. 1933. *Habitat selection in birds with special reference to the effects of afforestation on the Breckland Avifauna.* J.Anim.Ecol. 2:239-262.

Comments: No maps but original heath & plantation names given so may be able to locate through old FC maps. Most of the sites named (including two that are still heathland) can be found on modern OS maps. Precise area censused by Lack not known. Methods: transect walks counting 20 m either side. Avoidance of edge. Only relative abundance. Original data have been seen at the EGI and most include count times. Counts in June 1931.

SITE BOUNDARIES IDENTIFIED?: No. SITES EXIST: Yes, but at what successional stage? METHODS: O.K. ORIGINAL DATA: Yes at EGI. SAMPLE SIZE: O.K.

Potential: GOOD but comparative, not quantitative measures.

3.4.2Lack, D. 1939. *Further changes in the Breckland avifauna caused by afforestation.* J.Anim.Ecol. 8:277-285.

Comments: As Above.

Potential: GOOD for comparative data only.

3.4.3Lack, D. & Lack, E. 1951. *Further changes in bird-life caused by afforestation.* J.Anim.Ecol. 20:173-179.

Comments: As above, original data with EGI.

Potential: GOOD for comparative data.

3.5 Woodland

3.5.1Lack, D. & Venables, L.S.V. 1939. *The habitat distribution of British woodland birds.* J.Anim.Ecol. 8:39-71.

Comments: Massive enquiry; 77 sites. No maps. Original sites were supposed to be with the EGI but they are only referred to by the county, size and species composition of the wood. Methods; slow walk through wood assigning a score of 1-3 for a species, depending upon its abundance. Therefore can probably only replicate on a species relative abundance basis. May be able to identify some of the woods through local knowledge. Can almost certainly replicate Bagley Wood (by W.B. Alexander - see Lack MS in EGI archive). There is some data on validation of methods (EGI).

SITE BOUNDARIES IDENTIFIED?: No. SITES EXIST: Most will, but at a very different successional stage to that when surveyed. METHODS: Can replicate, but not very satisfactory. ORIGINAL DATA: Counts in Paper. SAMPLE SIZE: Good.

Potential: Fair if only relative abundance of species is required and if woods can be identified.

3.5.2Colquhoun, M.K. 1940. *The density of woodland birds determined by the sample count method.* J.Anim.Ecol. 9:53-67.

Comments: Site identified by name and area (11 ac). Recorded no. adults/10 h during dead slow timed walk (no distance limits). Compared with a complete census (unfortunately no methods were given for the complete census).

SITE BOUNDARIES IDENTIFIED?: No. SITE EXISTS?: ? METHODS: Could replicate. ORIGINAL DATA: Only for complete census. SAMPLE SIZES: Small (36 species, 123 birds).

Potential: POOR.

3.5.3Colquhoun, M.K. 1941. *The birds of Savernake Forest, Wiltshire.* J.Anim.Ecol. 10:25-34.

Comments: As above. Counts per hour. Slow walks in different habitat types but at different speeds. Study plots not given. Takes 'index of conspicuousness' into account.

SITE BOUNDARIES IDENTIFIED?: No. STILL EXISTS: Yes. METHODS: Poor. ORIGINAL DATA: Yes. SAMPLE SIZE: O.K.

Potential: POOR.

3.5.4Elton, C.J. 1935. *A reconnaissance of woodland bird communities in England and Wales.* J.Anim.Ecol. 4:127-136.

Comments: Only species lists recorded. 16 sites.

Potential: NONE.

3.6Mixed

3.6.1Alexander, H.G. (1974) Seventy Years of Birdwatching. (pp 49-70) *Poyser & Poyser Ltd.* Herts. SEE ALSO:

Alexander, H.G. & Alexander, C.J. (1909) *On a plan of mapping migratory birds in their nesting areas.* British Birds 2:322-326.

Alexander, H.G. (1911) *Mapping migratory birds.* British Birds 5:103-105.

Comments: These studies by the Alexander brothers represent the first attempts to census birds by the mapping method. Beginning in 1909 several areas were mapped; Tunbridge Wells, Wye, Romney Marsh, Dungeness, Freshwater Bay and the West Midlands reservoirs. Unfortunately these maps were restricted to summer migrants and indeed were plotted because of the B.O.C. Migration Enquiry of the time rather than to provide a census as such. Although it appears that some of the areas mapped were subject to a complete search, involving registering bird song and looking for nests, there are no formal methods and no indication of search effort. The authors themselves admit that some maps are far more complete than others but there is no means of knowing how long was spent in, or how many visits made to, any particular area. One published map of Tunbridge Wells is in fact the combined results of 8 consecutive years.

SITE BOUNDARIES IDENTIFIED?: Yes. SITES EXIST?: ? Some will. METHODS: Poor. ORIGINAL DATA?: Some. SAMPLE SIZE: O.K. for most species.

Potential: POOR.

4. DISCUSSION

Of the 20 studies assessed, 4 were classified as having no potential for repetition, either because the study site no longer exists or because the methods used were inadequate. A further 9 studies were assessed as having poor potential, normally because of poorly described study sites and/or methods and often because of small sample sizes. One study on woodland was classified as having fair potential; this suffers from not having the precise sites identified and from only recording an index of the relative abundance of species. Moreover the successional stage of the woods concerned will have changed dramatically during the 50 years of the survey. Thus changes in the bird community would be expected and it would be hard to separate population changes from changes in distribution as a result of the changing successional stage of the wood.

Of the original 20 studies, only 6 were classified as having good potential for repetition. Thomas's survey of downland birds could be easily repeated but sadly comparisons could not be made with other surveys since he was deaf and all his bird registrations were visual. Lockley's census of Skokholm would be ideal for repetition but the isolated nature of island habitats would mean that it would be both difficult to interpret any differences in the bird populations and dangerous to extrapolate to the mainland population. Of the 4 remaining, 3 comprise the results of a single long term study of the afforestation of the Brecks by David and Elizabeth Lack. Although this study is concerned with comparative rather than absolute densities, it is well worth repeating. Lack was the first person to show a succession in a bird community, following a habitat succession. At the time of the last publication, in 1951, the most mature plantations surveyed were 28 years old. The study could now be extended to look at the bird communities in 68 year old plantations and, if alternative sites were built into the sampling regime, these could include the 100+ year old retentions within Thetford forest. It is recommended that this should be used as a case study.

Finally Campbell's comparison of 'industrial' and 'rural' farmland in Wales should also be used as a case study. Campbell defines the study sites and methods well and provides the original count data. Repetition of this particular study could provide some useful insights to population changes on farmland.

Overall the results of this exploratory research are very disappointing. The majority of historical surveys are so plagued by problems of ill-defined methodology and/or inadequate sample sizes as to make the interpretation of the results of any attempt at replication extremely difficult. Moreover because these were pioneer surveys, the methods used vary widely between the 20 studies assessed; this makes it impossible to make valid comparisons between surveys, let alone between years. In view of this it is extremely unlikely that the original aim of the project; to gain quantitative information on long term population changes in birds, can be fulfilled. Two of the 20 surveys have been highlighted as worthy candidates for continuing case studies.

The original aim of the project is more likely to be achieved by repeating surveys on as many of the original (1960s) Common Bird Census plots as possible. Although the time scale would be considerably less than a comparison with the pre-War censuses, study sites would be precisely mapped, the methodology is well defined and habitat data would be available.

ACKNOWLEDGEMENTS

Linda Birch was extremely helpful in allowing us access to, and showing us around, the EGI archives.