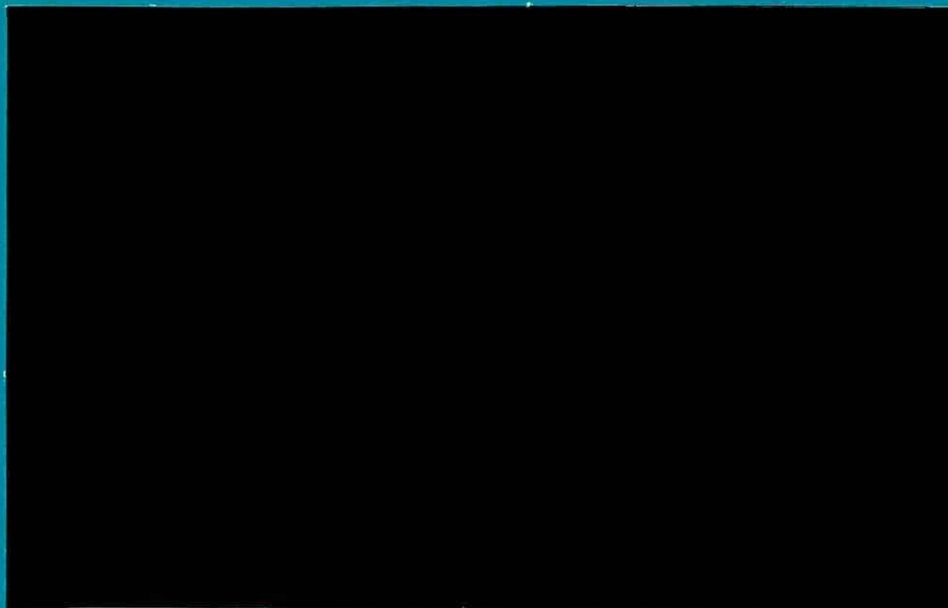


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**Institute of  
Terrestrial  
Ecology**





HEDGEROW MANAGEMENT

Progress Report to the  
Department of the Environment  
on contract PECD 7/2/86  
(ITE Project T02058g1)

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## 1 INTRODUCTION/SUMMARY

A contract entitled Hedgerow Management was let to ITE, with Cobham Resource Consultants, Silsoe College and York University as subcontractors, by DOE in October/November 1989.

This contract calls for ITE to assess the costs and benefits of hedgerow management practices; to evaluate the uses to which a farmer can put a hedgerow and to estimate the costs of management in relation to these agricultural benefits, as well as the environmental and wildlife benefits that may accrue from different types of management.

In particular the final report is to "identify where room exists for flexible adjustment and modification of grant strategy to optimize wildlife and landscape values of hedgerows".

To this end the work is currently organised in three sections: a review of existing data, field surveys of farmer attitudes, of hedge management and of floristic composition, and subsequent analysis and cost benefit appraisal.

This interim report exemplifies progress on reviews of existing data in sections 3 (Literature) and 4 (Birds) and reports on the progress of field surveys in section 5.

Analysis has only really just reached a preliminary stage but some tentative conclusions are put forward in each of the relevant sections. The cost benefit appraisal stage will follow when analysis is complete.

In addition this report indicates the liaison activities (in Section 2) and puts forward suggestions for possible formats for final reporting (in Section 6).

## 2 LIAISON AND ORGANISATION

### 2.1 Introduction

The contractors have met formally twice, on 21 May to review progress on the first six months and plan the summer field programme, and on 3 September to review progress on the surveys. It is suggested we meet again either in late October or early in November to review preliminary analyses and plan the details of the cost benefit appraisal stage.

### 2.2 First Liaison Meeting

The meeting on 21 May discussed and agreed details of the survey stages: that Cobham Resource Consultants would design a questionnaire and carry out farmer interviews, that ITE staff would be trained by Cobhams in Landscape evaluation and carry out that evaluation while visiting sites to record management and wildlife.

It was also agreed that the survey would be linked closely with the 1990 Survey and sample some of the same sites within selected core land classes, to ensure optimal extrapolation from small samples.

At this meeting progress on the literature search was reported along with a list of contacts made with JAEP projects, Wye College, FWAG and MAFF/ADAS, all of whom had current relevant work.

DOE tabled a list of questions which they wished to be addressed in interim reports. It was agreed that only 'off the cuff' responses could be made before analysis was complete.

For the record the questions were:-

1. Where should we aim to manage hedgerows?
  - which geographical areas?
  - in relation to other features?
  - in relation to crops?

If possible, relate those priorities to the information on hedgerow loss available from the MLC and ITE land-use surveys.

2. What management regimes should we encourage.
3. Is there a minimum size for hedgerows as a wildlife/landscape feature?
4. What is the extra value of hedgerow verges, and how do these relate to the factors in 2?
5. Ditto - but hedgerow trees
6. What is the optimum density of hedgerows in terms of flora and fauna?
7. What is the optimum structure for hedgerows as wildlife corridors, ie in terms of width, continuity, presence of verges etc?



8. How important is species composition to hedgerows as a wildlife habitat?
9. Is there a shortage of people with the skills to manage hedgerows, eg laying hedges?
10. Is there a lack of knowledge (among hedge-owners) as to how to manage hedges?
11. What are the costs of various hedgerow management procedures, and the time needed?

and the responses from ITE were:

1. Where to manage hedgerows?
  - a. Geographical? - Need to be managed wherever they occur. Need to plant new ones in rolling landscapes where they used to exist, but have been removed - but not, for example, on Fens?
  - b. In relation to other features? - Where they are, or have been, an important component of landscape value, management should reflect this value. Also to screen undesirable features and to act as wildlife corridors linking woods etc.
  - c. In relation to crops? - Grassland - stockproof barrier and shelter.

Arable - Value for overwintering predatory beetles.  
Shelter preventing wind blow on light soils

Game birds as a crop - see Game Conservancy studies

2. What management regimes?
  - a. To create diversity of size and structure.
  - b. To appreciate the farmer's constraints in terms of shade, crop competition and area of land occupied by hedges; yet to stress the locations where hedges could be larger eg running North to South, on northern boundaries and beside grassland or uncropped land such as roads, streams, tracks, set-aside, railways, game cover.

3. Minimum size?

For wildlife - no minimum - even a grass strip has a value.

In general, value to wildlife increases with height, width and density.

For landscape - visual impact depends upon distance from observer - small hedges near roads have a value which is lost at a distance or in tall crops.

4. Hedgerow verges

- a. Cover for game and ground nesting birds eg Yellowhammer.
- b. Cover for predatory beetles (1c. above).
- c. Potential site for wild flowers - nectar and food plants for insects and larvae and seeds for birds.
- d. Cover for small mammals - food for birds of prey and carnivorous mammals.
- e. As additional zone to reduce physical and agrochemical effects upon hedge and hedge bottom.
- f. When established, a verge of perennial species requires less management input than annual use of total herbicides in attempts to control difficult weeds such as cleavers and sterile brome which colonise base ground.
- g. For access - private or public.

5. Hedgerow trees

- a. To support, or provide corridor for, woodland birds.
- b. Act as song posts for many species.
- c. Act as nest sites for tree nesting species and eventually hole nesting species.
- d. Landscape value.
- e. Timber potential.

6. Optimum density - Vague question - does it mean amount per unit area in landscape or density of growth from?

Size, shelter and cover value of hedge will affect birds using it, density of shade, litter and water balance will affect the flora beneath and near to the hedge.

7. Optimum structure as a wildlife corridor?

Tall, wide, dense hedge with hedgerow trees and a grass verge + wet ditch or drain with standing or slow flowing water for aquatic species.

8. Species composition?

Diversity is the key - shrubs with flowers have visual and nectar value.

Shrub with nuts and berries if managed to allow fruiting have food value to wildlife.

Evergreens (including ivy) have winter shelter and protected nest site value especially early in the year.

Species such as elm appear to have less value, other than as eventual hedgerow trees.

9. Skills? - Probably (CRC may cover this) a shortage of skilled hedge layers and also in view of costs and use of wire fences, probably little demand for the skills. Coppicing of tall hedges can be carried out mechanically and a subsequent hedge of higher conservation value created and maintained by appropriate use of mechanical cutters.
10. Knowledge of management? Not so much a lack of knowledge of practical methods as a lack of knowledge of the relative values of various options.
11. Costs? (CRC to deal with this) but better management may involve reduced costs.

### 3 PRELIMINARY ANALYSIS OF LITERATURE (M D HOOPER)

#### 3.1 Sources

For a preliminary analysis of the coverage of the literature two sources of references have been used: a comprehensive list of publications up to 1973 maintained by M D Hooper (largely as published in Pollard, Hooper & Moore 1974) and a computer search, by ITE library services, for all references with the key words, "hedge, hedgerows, shelterbelts and field margins", with modifiers "ecology, agriculture, landscape and management" back to 1972.

These sources provide a basic list of 145 references apparently relevant to this study.

#### 3.2 Analysis: method and first results

These 145 references were first categorised under 10 headings. The results are shown in Table .

|  |       |
|--|-------|
| 1. Not relevant (all from computer list) | 44    |
| 2. Management techniques                 | 7     |
| 3. Stock, shelter and restraint          | 3     |
| 4. Shelter, general                      | 17    |
| 5. Birds in hedges                       | 27    |
| 6. Mammals in hedges                     | 8     |
| 7. Plants (incl. weeds) in hedges        | 14    |
| 8. Pests in hedges                       | 10    |
| 9. Landscape value                       | 3     |
| 10. Statistics (loss of hedges)          | 18    |
|  | <hr/> |
|  | 145   |
|  | <hr/> |

This confirms that 'Birds in hedges' has been researched far more frequently than 'Management techniques' or 'Landscape value' which are major objectives in this study.

#### 3.3 Discussion and conclusion

By far the largest category in the computer search list was "Not relevant" (44 items). These include 12 'Polemics' with no real data, 11 with Hedge as the surname of the author, 3 on 'Hedges against inflation' and 15 on real hedges in climatic conditions alien to Europe (eg hedges to prevent sand blow in the Sahel).

Moreover the computer search produced no references to work unknown to M D Hooper and failed to list a number of important references, including the Countryside Commission's "New Agricultural Landscapes" study (Anon 1974 and 1984) and the review published by the NCC on "Woods, Trees and Hedges: A review of changes in the British Countryside" (Peterken and Allinson 1989).

These two failures may be explained by the choice of key words in the first cases and by the second being published too late for inclusion in the computer database, but an ad hoc list of references maintained by

M D Hooper since 1972 has about 50 further references not given by the computer search. Hence the preliminary analysis is of a sample and may be flawed.

### 3.4 Possible further work on the literature

It would be possible to check the references given in all the references to be found in Pollard, Hooper & Moore (1974), a new computer listing and Hooper's ad hoc listing (these three sources should give more or less comprehensive coverage). It is, however, unlikely that the results, that 'Birds in hedges' was the best researched category and that relatively little has been published on 'Management Techniques' or 'Landscape Value', would be invalidated. Censory inspection of Dr Hooper's listing suggests 'Shelter' and 'Plants' are somewhat under-represented in the current analysis.

In addition even in the best researched areas there are still hypotheses untested. For example Hooper (1970) suggested that hedgerow loss, up to a critical length of hedgerow per unit area or field size, did not affect bird numbers breeding on farmland (above the critical length bird numbers would be limited by food supply, below it by competition for nesting sites). This view was criticised by Murton & Westwood (1974) but their recorded hedgerow loss did not reach the critical limit proposed by Hooper (1970). Despite many subsequent excellent studies on birds of farmland (eg Arnold 1983, O'Connor & Shrub 1986) this point is still unresolved. While there is some evidence to support Hooper's suggestion (eg see part 4.2) it is still not proven nor refuted. Hence a purely statistical analysis of numbers of references may have limited value yet the alternative of a critical review by individuals could be said to be biased by the views of the individuals.

The Department is therefore requested to consider what further steps should be taken: a statistical analysis of 'individualistic' critical review or both?

## 4 BIRD STUDIES (T PARISH)

### 4.1 Introduction

For many years ITE has been collecting data on birds nesting in hedgerows and the effects on birds of changing farm practice. A major data set, on Cambridgeshire farms, is about to be fully analysed by ITE under a part-funded contract to MAFF.

### 4.2 Analysis and results

Preliminary analyses have been done which show that two major factors are the size of the hedge, especially its height and the adjacent land use.

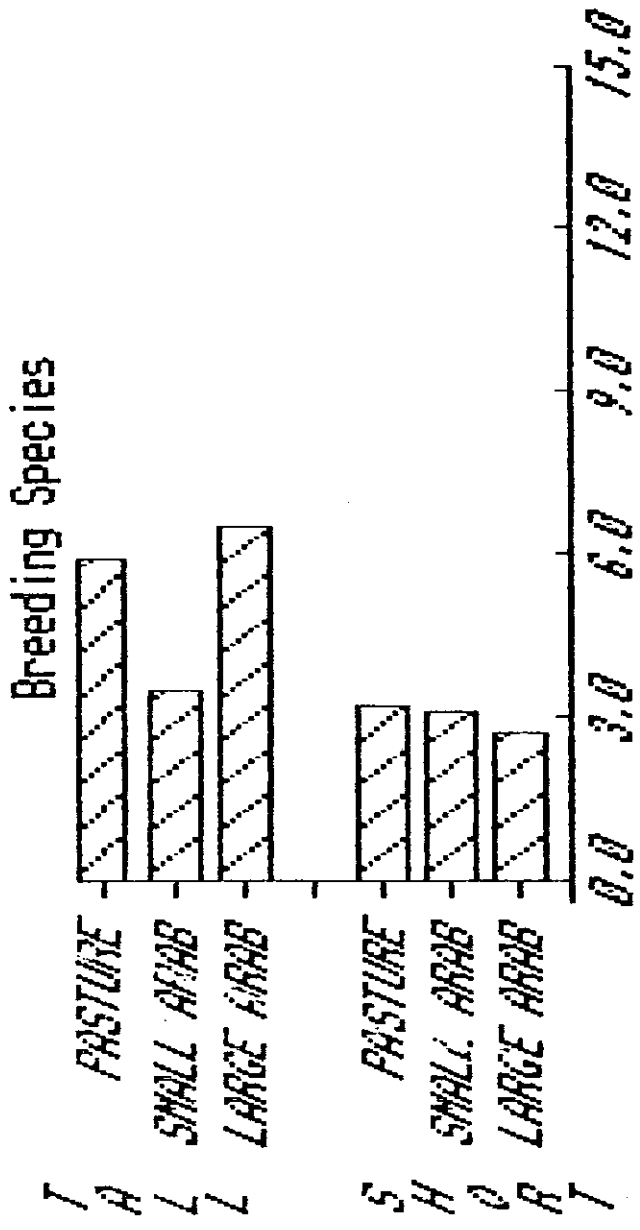
Thus for breeding birds (Fig. 3) tall hedges have more species than short ones and tall hedges adjacent to small pasture fields are better than tall hedges around small arable fields. That tall hedges around large arable fields appear best of all may support Hooper's suggestion (see 3.4) that birds can concertina their nesting territories. It is a reflection of the scarcity of habitat in such a landscape.

The very high winter populations (see fig. 4) in pasture hedges may reflect the relative infrequency of trimming and thus the availability of berries.

4.3 Further analyses of this data will, it is hoped, demonstrate the effects not only of height but also width and plant constituents and not only contrast arable with pasture but also the effect of depth of adjacent ditches and whether or not they carry water.

FIG. 3.

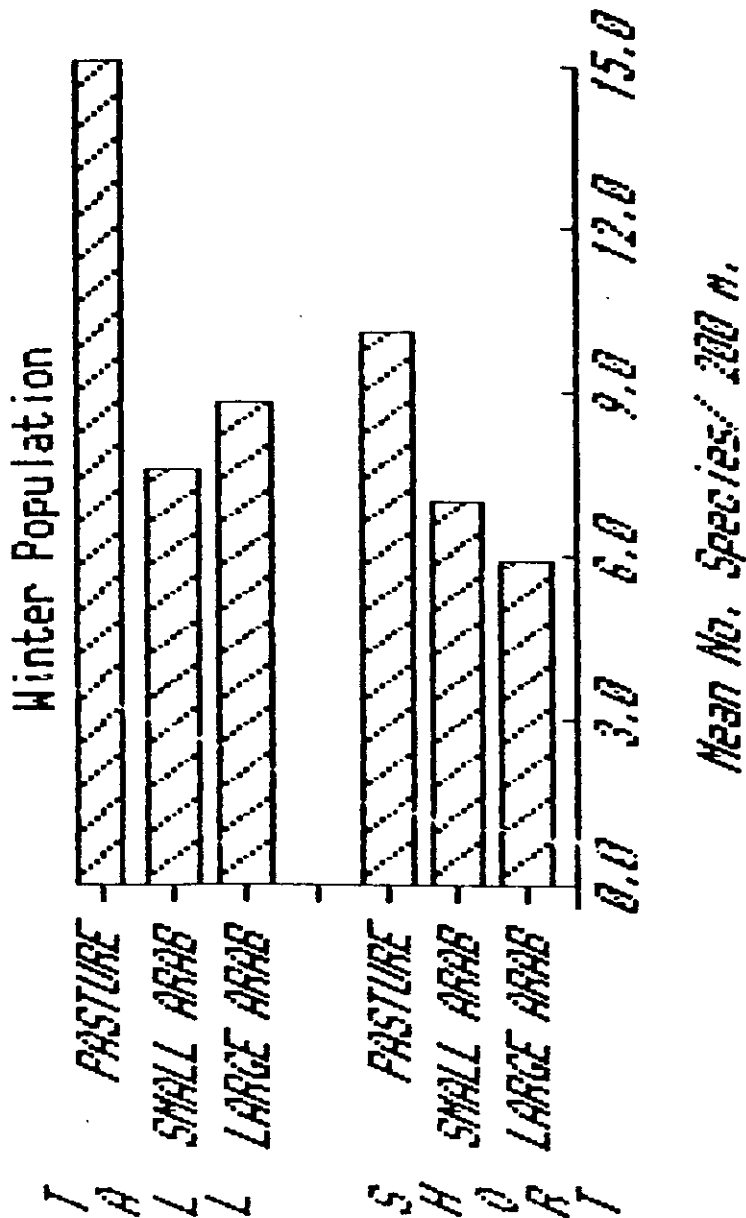
# BIRDS OF HEDGEROWS



Mean No. Species: 200 M.

FIG. 4.

# BIRDS OF HEDGEROWS





## 5 PROGRESS ON SURVEYS

### 5.1 Hedgerow and Landscape Survey (Ms Green and Miss Buckley)

#### 5.1.1 Progress

As of September 25 sites have been surveyed for landscape and approximately 100 hedges recorded in terms of actual management and flora. Recording should be complete by the end of October.

#### 5.1.2 Preliminary results

There appears to be a simple dichotomy between livestock and arable farms. Stock hedges tend to be taller (>1.5 m) and broader (up to 3 m) and most are back-fenced, while on purely arable farms hedges are rarely much more than 1.5 m tall, are not back-fenced and frequently have gaps. Nevertheless some hedge remnants, of a few scattered shrubs in a line, have quite a high floristic diversity. Thus though adjacent land use (stock v. arable) appears to be the main controlling factor and stock farms have hedges which contribute most to the landscape and to floristic richness even tattered remnants can be significant for floristic diversity on arable farms. The smaller hedges and the remnant character of many of them on arable farms means that they make less of a contribution to landscape value.

#### 5.1.3 Conclusions

Without further analyses no firm conclusions can be drawn at this stage. In addition one of the field surveyors has suggested that the farms surveyed may be untypical: simply because of the Ecoluc surveys in 1978, 1984 and in the 1990 survey the farmers may be becoming more environmentally aware than their neighbours.

The Department are invited to consider this thesis. It could be tested within the 1990 Survey by seeking differences between farms which have and those which have not changed hands, if sufficient farms have, in fact, changed hands between individual surveys. Alternatively this contract could be extended to cover a sample of adjacent farms. (The first kind of analysis could not be carried out within this survey: only 4% of farms in our sample appear to have changed hands.)

### 5.2 Farmer Interviews (Ms S Peay, Cobham Resource Consultants)

#### 5.2.1 Progress

As of September Ms Peay has interviewed 41 farmers, spread more or less evenly across all land classes. She expects to complete all interviews during October. Meanwhile her data is being transferred to Monks Wood for coding prior to analysis in November.

### 5.2.2 Preliminary results

There appears to be two basic dichotomies: one between livestock and arable farmers and the other between farmers with large of small areas farmed.

Livestock farmers value hedges for their shelter effect, landscape aspects rank a poor second. Very few are restoring or positively managing hedges, most are merely patching and have a 'make do and mend' philosophy. In contrast the arable farmers tend to show a less sophisticated appreciation of the desirable elements of hedgerow management - regular, routine trimming is apparently often considered to be sufficient to maintain good hedges in perpetuity. Arable farmers do, however, show more appreciation of landscape values and a significant number have a more positive policy for planting, at least trees.

Farmers with small acreages tend to be very pessimistic about the long term prospects for the farming industry and seem unlikely to take active steps for the long term management of hedgerows without significant, extra financial assistance: 40% grant is not enough. In contrast farmers with large acreages (the largest, in Lincolnshire, is about 12,000 acres) are quite likely to have a comprehensive conservation policy.

### 5.2.3 Conclusions

No firm conclusions can be reached and the above 'results' are only provisional as small farms tend to be livestock farms and large farms are usually arable. Definitive results must therefore depend on the detailed analysis.

## 6 FINAL REPORT: SUGGESTIONS

The formal, contractual, requirement is for 50 copies of a report of no more than 50 pages with supporting tables and other descriptive material. There is also provision for the report to be circulated to a wider audience and in the original bid made by the contractor there is mention of a seminar to disseminate the results.

The commitment by the Government in the recent White Paper to provide for the conservation of hedgerows seems to us to add particular weight to the need for the report (or some form of it) to be circulated to as wide a public audience as possible.

This in turn raises questions as to the style and language of the report and especially to its illustration.

The Department is therefore asked to consider whether the report as such should be published or that it be published in an abridged form as an illustrated booklet and to consider further the possibility of illustrated leaflets on hedge management.

7 REFERENCES

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