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Evaluation of the nature conservation outcomes of the Woodland Grant Scheme in Wye and Avon Conservancy

Phase 1: Area study

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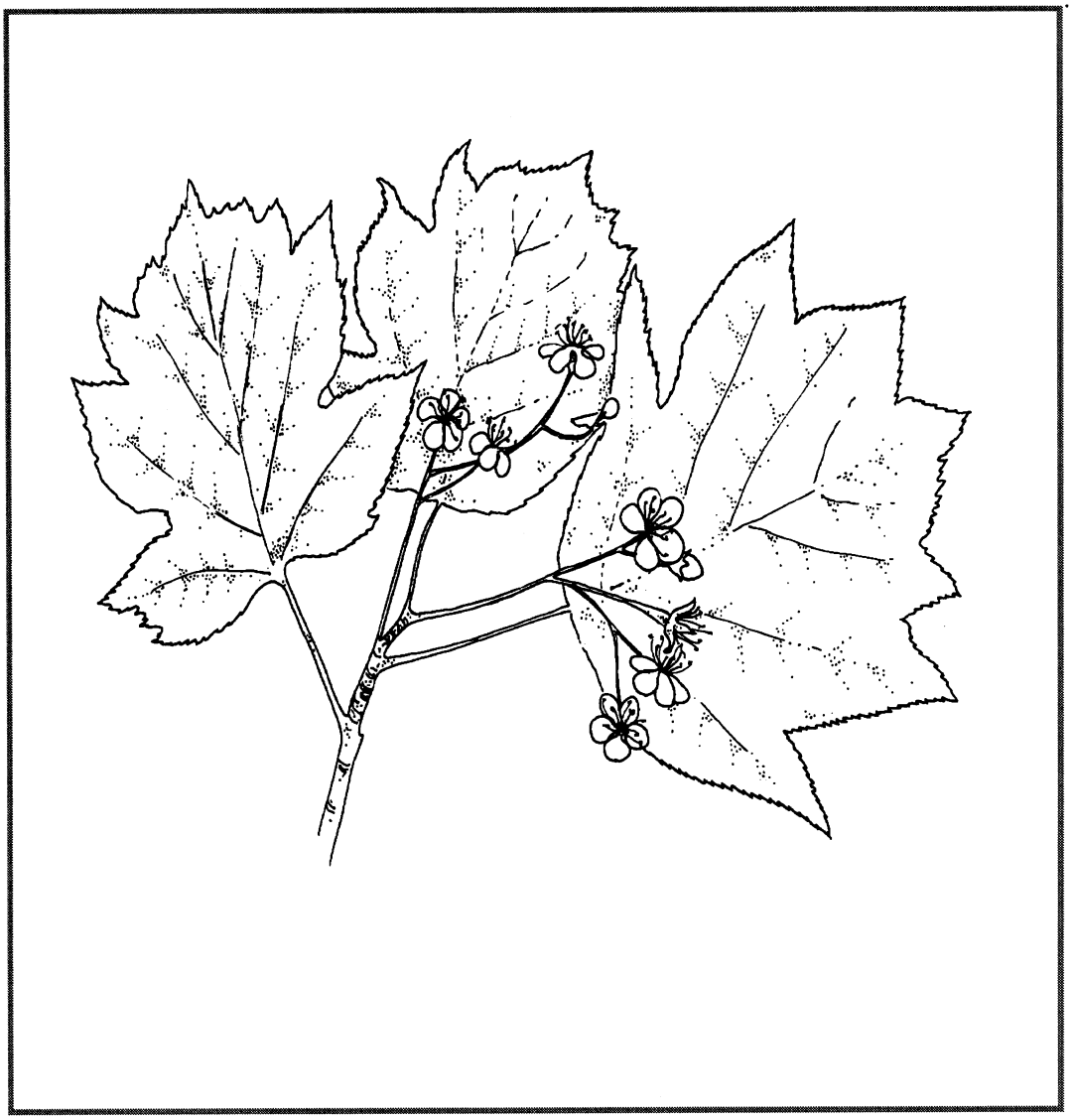

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English Nature Research Reports

Number 268

Evaluation of the nature conservation outcomes of the Woodland Grant Scheme in Wye and Avon Conservancy (Phase 1 Area Study)

Simon Pryor
David Martin

Prepared for:
English Nature: Three Counties Team
Forestry Authority: Severn, Wye and Avon Conservancy
Steering Group: Mark July (English Nature)
Bill Heslegrave (Forest Authority)

Pryor & Rickett Silviculture
The Sheepcote
Monks Orchard
Lugwardine
HEREFORD
HR1 4AG

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Preface

This report was jointly commissioned and funded by the Three Counties Team of English Nature and the Wye and Avon Conservancy (now Severn, Wye and Avon Conservancy) of the Forestry Authority. English Nature in particular wishes to acknowledge the work that FA staff put in to the project. Finally I would like to thank Mark July (EN) and Bill Heslegrave (FA) who actually ran the project.

This report represents the views of the contractors and not necessarily those of either English Nature or the Forestry Authority.

Keith Kirby

Contents

Summary 1

1. Introduction 2
   - 1.1 Natural Areas Special Projects 2
   - 1.2 Overall study aim 2
     - 1.2.1 Phases 2
   - 1.4 Guidelines, guides and standards 3
   - 1.5 Management 4

2. Objectives 5

3. Methodology 8
   - 3.1 Sample area 8
   - 3.2 Time frame 8
   - 3.3 Woodland areas 8
   - 3.4 Grant scheme files 9
   - 3.5 Data from scheme files 10
   - 3.6 Database Structure and Analysis 12
   - 3.7 Maps 13
   - 3.8 Data limitations and problems 16
   - 3.9 Recommendations for Future Procedure 18

4. Results 18
   - 4.1 Cartographic Data 18
   - 4.2 Scheme data 19

5. Discussion & conclusions 23
   - 5.1 Woodland Areas and Designations 23
   - 5.2 Management and neglect 23
   - 5.3 Areas under Different Grant Schemes 24
   - 5.4 Operations approved 24
   - 5.5 Conservation designations and species 25
   - 5.6 Felling and restocking completed 25
   - 5.7 Felling rates 25
   - 5.8 Comparison with hypothetical strategic objectives 26
   - 5.9 Further work 27

6. References 28

Appendix 1 29

Appendix 2. Recommendations for Future Studies and Procedures 30

Appendix 3. Project specification and invitation to tender 32

Figures

Figure 3.1 Hereford Plain Natural Area 7
Figure 3.2 Example of data retrieved from a scheme file 14

Tables

Table 4.1: Total areas (ha) and numbers of schemes 19, 20
Table 4.2 : Areas (ha) approved for different operations 20
Table 4.3: Areas (ha) under different designations 20
Table 4.4: Areas (ha) under different species (derived) 20
Table 4.5: Areas (ha) of restocking completed: a. by scheme; b. 20
Table 4.6: Percentages of total woodland area under each scheme 21
Table 4.7 : Percentages of each scheme area under different operations 21
Table 4.8 : Percentages of each scheme area under different designations 22
Table 4.9: Percentages of each scheme area under different species 22
Table 4.10 : Percentages of woodland felled and restocked under each scheme and each designation 22

Summary

The most significant findings of this study of the Hereford Plain Natural Area (now named Central Herefordshire) can be summarised as follows:

- around two-thirds of the existing woodland is or has been under management during 1985-95;
- the proportion of ancient semi-natural woodland (ASNW) under management is significantly less than that for other woodland;
- WGS II has been by far the most popular woodland grant scheme during this period;
- fellings *approved* were rather high under WGS I (20% of the total area under the scheme) but have fallen to an average of 6-7% of the area included in each Scheme;
- overall felling and restocking has been *completed* on around 7.5% of the area approved for management under a scheme since 1985;
- this gives a theoretical 'rotation length' or 'turnover period' of around 130 years (which may represent over 160 years for the semi-natural woodland);
- approximately 40% of the ASNW is in minimum intervention (ie excluded from schemes) and it appears that much of the remaining 60% is being managed under a high forest regime.

Two other conclusions have been drawn from this study. Firstly, the manual analysis of Grants Scheme files is difficult and time-consuming, and there is great scope for increasing the use of the WGS computer database. Secondly, carrying out such a study on such a small area is not very productive. There is not sufficient data to draw firm conclusions which can be applied elsewhere, nor to establish trends that can be extrapolated. These conclusions combine to make it unrealistic to repeat this study on a larger scale until WGS records are more readily accessed and analysed directly from the database.

1. Introduction

1.1 Natural Areas Special Projects

The concept of Natural Areas (NA's) was developed in the early 1990s by English Nature in order to better co-ordinate action across areas of similar nature conservation character. Thus areas such as the Greater Cotswolds (which crosses 8 county boundaries) are considered as one tract of land, rather than a conglomeration of parts of different administrations. By the same token, these areas reflect a widely shared 'sense of place' and so, it is hoped, provide a framework for securing public support and delivering more effective action. Natural Area objectives apply to all types of woodlands. The concept therefore differs from previous approaches which have targeted special sites (eg Sites of Special Scientific Interest). NA Special Projects provide essential support to the NA concept. Their wider aims include:

- consolidating current knowledge about nature conservation at the NA level, providing a basis for promotion to the wider community;
- establishing priorities and focusing on issues of significance to nature conservation;
- encouraging inputs from relevant external agencies.

This study was commissioned as a Natural Areas Special Project by the English Nature Lowlands and Three Counties Team in conjunction with the Forestry Authority Wye & Avon Conservancy.

1.2 Overall study aim

The primary aim is to evaluate the effectiveness of the Woodland Grant Scheme (WGS) at realising nature conservation objectives in the private sector ancient woodlands of the Wye & Avon Conservancy (which has since expanded to become the Severn, Wye & Avon Conservancy).

Findings from this and similar studies will inform future changes in the approach to the operation of WGS. In particular, English Nature (EN) seeks to identify ways in which grant can be used more effectively to benefit nature conservation and to take an objective look at the real outcomes of WGS management on Sites of Special Scientific Interest (SSSI). The Forestry Authority (FA) wishes to have better knowledge that operations approved under WGS are in fact having the desired conservation end result and are meeting guidelines and standards. The FA further wishes to investigate possibilities for a more discretionary use of WGS as a management incentive.

Further details of Aims and Brief are given in Section 2 and Appendix 3.

1.2.1 Phases

The study has been broadly split into two phases. The first is an 'area study', which is covered by this report, and the second a set of 'site surveys', which will be covered by a second report.

It is the aim of the area study to assess the impact of WGS management at the landscape scale. In that grant schemes are awarded on the basis of acceptability at the site level

only, there is a need to evaluate their cumulative effect over space and time in a wider geographical context (a Natural Area).

The site surveys will assess in detail the effect of WGS on a variety of different SSSI woodlands. The evaluation will involve comparison of woodlands under WGS with their previous state, assessment of changes and rates of change within such woods from a conservation perspective, and analysis of whether owner, woodland type or designation influence the effectiveness of WGS.

1.3 Grant Schemes

The Forestry Act of 1967 empowered the Forestry Commission to provide grants and control felling. The *Woodland Grant Scheme (WGS)* has been available since 1988, when it was introduced to replace previous schemes and tax benefits. Since then it has received two major 'facelifts', involving reorganisation of the grants and reflecting changes in national policy. The resulting three phases have been termed Mark I, Mark II and Mark III, with Mark III being the current scheme. (See Section 3.4 for the period of operation of each of these schemes).

The various versions of WGS and its predecessors, the *Forestry Grant Scheme (FGS)* and the *Broadleaved Woodland Grant Scheme (BWGS)*, have all covered both new planting and the management of existing woodland. However, this study is only concerned with their impact on the management of existing woodlands. All these Grant Schemes have included 2 essential elements: permission for felling or thinning and grants for restocking. *Management Grants* were also made available as from WGS Mark II to support management which is seen to provide recreational and environmental benefits.

1.4 Guidelines, guides and standards

In order to advise woodland owners and managers of current environmental standards, a set of *Guidelines* have been introduced, relating to the various different topics that must be addressed before a grant application can be accepted. These are entitled, respectively, *Forest Nature Conservation, Forest & Water, Lowland Landscape Design, Forest Landscape Design, Forest Recreation, Community Woodland Design* and *Forests & Archaeology*.

More recently, the FA have also produced a set of 8 *Forestry Practice Guides* on the management of Ancient Semi-Natural Woodland (ASNW) of 8 different types. However, while it is essentially a requirement of the Grant Scheme that the application heeds the Guidelines, the Guides were produced to give advice on the appropriate options for specific situations. In a sense, then, the Forest Nature Conservation Guidelines provide the minimum requirements, while the Forestry Practice Guides give recommendations and examples of 'best practice' in terms of nature conservation.

The *UK Forestry Standard*, currently under consultation, is a single document which brings together the standards and regulations embodied in the Guidelines and Guides. It has been produced jointly by the Forestry Commission and the Department of Agriculture for Northern Ireland and at present it incorporates certain recommendations which are additional to those in previous documents. The final draft will represent the minimum requirements expected of an applicant to a grant scheme.

An obvious means of evaluating the impact of WGS on nature conservation is to assess the degree of compliance with the Guidelines. Such a study was commissioned at a national scale by the Forestry Authority in 1994 and undertaken by Canopy (FC 1993).

However, this study did not look at the extent to which management was in accordance with the recommendations of the Forestry Practice Guides.

One inherent problem of such general Guidelines is that their recommendations may not be appropriate to all situations. Thus even 100% compliance may not represent ideal achievement of nature conservation objectives in every situation. This possible shortcoming can only be investigated by an expert assessment of the management most appropriate to individual sites.

1.5 Management

The main aim of WGS, as it applies to existing woodland, is to encourage active management of the woods to deliver multiple benefits - only one of which is nature conservation. Since the introduction of the Broadleaves Policy in 1985, nature conservation objectives have been paramount in grant schemes covering ancient semi-natural woodland. However, the aim of increasing active intervention inevitably raises concern that natural processes, characteristics and features may be 'lost' or subsumed in the management imposed. Since the uptake of grant schemes in general, and WGS in particular, has been relatively high in the 'Three Counties' of Hereford, Worcester and Gloucestershire, this is a particularly appropriate location for such an evaluation.

Furthermore, in Herefordshire, about 70% of the woodlands are ancient, (compared with 35% in England). Of these ancient woods, half are classified as ancient semi-natural, and *of these*, nearly 20% are within SSSI's (NCC 1986). Nature conservation is therefore a particularly high priority in the area. It seems reasonable to assume that the conservation impact of Grant Scheme activity may be more clearly revealed here than elsewhere.

2. Objectives

In the majority of cases, nature conservation objectives can best be realised through careful management rather than neglect. Sometimes the 'best' management within any 5 year period may be that of no active intervention, or may involve as little as the erection of a stockproof fence. Essentially, however, in a wood under WGS management, the means by which an owner's objectives can be reached have been considered and agreed with the FA. Thus, WGS provides an important mechanism through which the FA can fulfil their nature conservation objectives for woodlands.

The aim of the area study is to assess:

- The effectiveness of the WGS for its contribution to realisation of nature conservation objectives at a Natural Area level.

- The cumulative impact to date of grant schemes on all the woodland within a representative sample part of a Natural Area.

- The extent to which schemes have affected and been sensitive to the conservation resource of the area and their cumulative impact on the woodland age class distribution in space and time.

- The possible future impact on woodland nature conservation at the landscape scale if WGS continues on a similar basis, with either the same or different levels of uptake.

The period over which schemes were to be assessed needed to be sufficiently long to give a proper appreciation of the sum effect of WGS management over time, and yet feasible in terms of the study. The study was therefore widened to look at all Grant Scheme applications approved since the introduction of the Forestry Commission's Broadleaves Policy in 1985. These include all WGS's and BWGS's, and some FGS's and Felling Licence Applications (LA's). The Broadleaves Policy represents a particularly relevant starting point in that it had major significance in terms of the conservation of ancient woodland. It introduced various measures relating to the maintenance and enhancement of Britain's broadleaves, including the completion of the Ancient Woodland Inventory and the publishing of Management Guidelines which gave much weight to the protection of ASNW.

The area study sought to reveal:

- the area (and percentage) of woodland under management and hence the percentage **not** managed;

- the effectiveness of each Grant Scheme at bringing woodlands into management;

- the extent and type of operations approved (i.e. thinning and felling), and hence the area proposed for **active** management;

- the amount of felling and restocking actually completed;

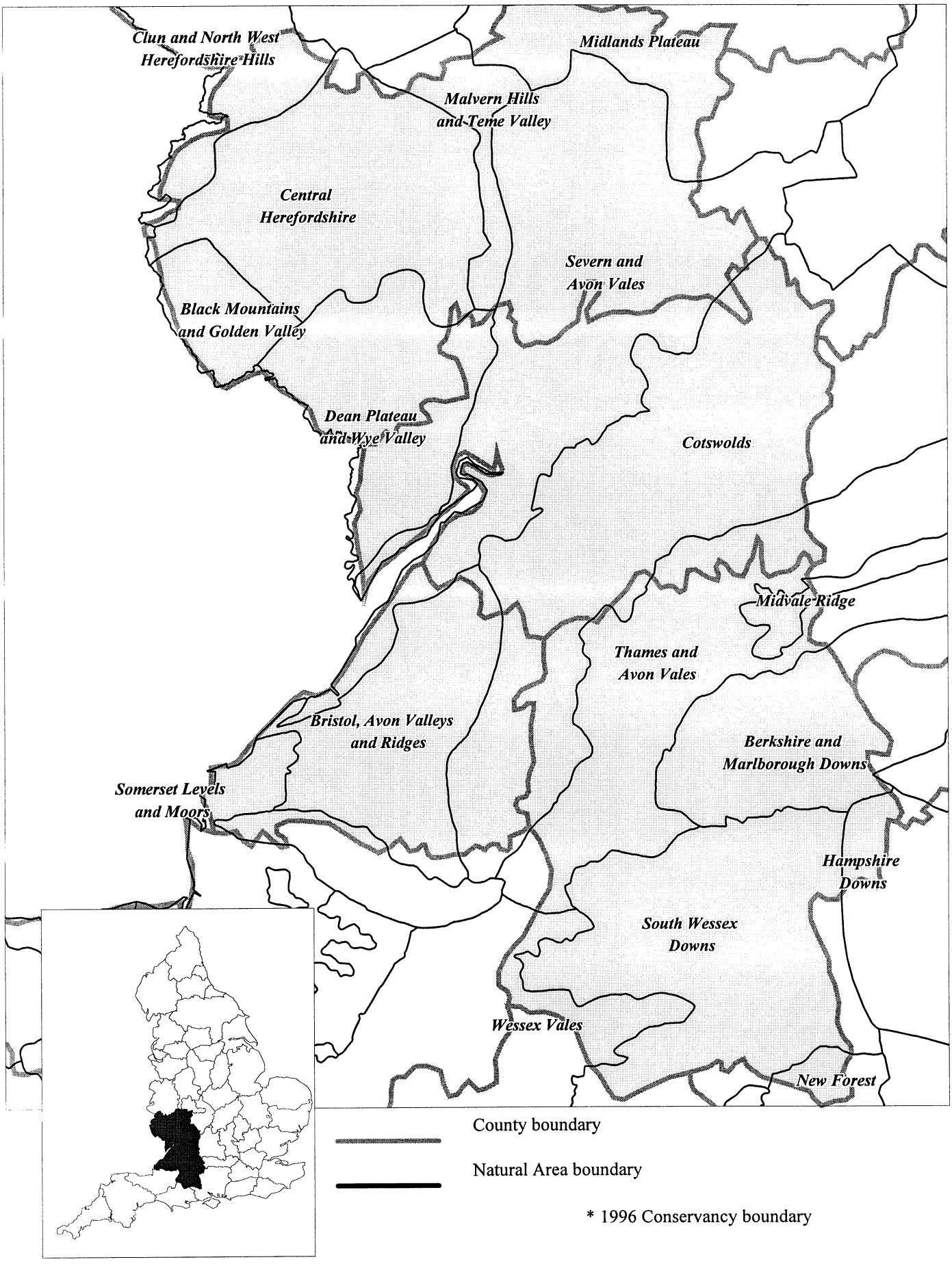
- the extent to which the present nature and distribution of schemes allows a set of hypothetical strategic conservation objectives to be met (these are detailed in section 4.2.8 of the project brief, appendix 3).

Areas of SSSI, Ancient Semi - Natural Woodland (ASNW), Plantations on Ancient Woodland Sites (PAWS), broadleaves and conifers each have a different level of priority for nature conservation. By looking at differences in the above parameters between such categories of woodland, an insight may be gained into the extent to which grant schemes have been sensitive to nature conservation priorities at the landscape scale.

Projections of felling and restocking rates can be made in order to assess the future impact of continuing with the schemes as they have been. Such a scenario can then be viewed in the light of long term nature conservation, with particular reference to Natural Area Objectives.

Figure 3.1 Location of Hereford Plain Natural Area, under its new name Central Herefordshire

Natural Areas in the Forestry Authority's Wye and Avon Conservancy*



3. Methodology

3.1 Sample area

In choosing a Natural Area to study, it was essential to find one which was of a landscape type common in lowland Britain, which had high woodland cover, a good range of woodland sizes, and which was manageable enough in area, such that a significant proportion of it could be covered by the study. For these reasons, the Hereford Plain Natural Area was chosen. It has woodlands varying in size from < 2 ha to > 200 ha and a 400 km^2 sample area covers nearly 40% of the Natural Area.

The sample area was defined by 4 adjacent 10 km x 10 km squares (S044, 54, 45, 55) in the central part of the Hereford Plain Natural Area (subsequently re-named as central Herefordshire). Together they form a larger square, the bottom centre of which cuts through Hereford City.

All woodland lying within these squares was included in the study, and stratified into PAWS, ASNW, SSSI and 'not ancient' for comparative purposes. If woodlands crossed the boundary of the sample area, only that part of them on the inside was included.

3.2 Time frame

The study aimed to include all schemes approved since the introduction of the Broadleaves Policy (1985). For ease of sorting schemes, all those approved in or after 1986 were included, and those from 1985 or before excluded (even though the policy was introduced within the latter half of 1985).

While this provides an understandable framework for the sorting of schemes, care should be taken in its interpretation. It does **not** represent all scheme activity from January 1986 to the present. Schemes are approved on the basis of 5 year plans. Thus even schemes approved as early as 1981 may still have been active during the early part of this period. Similarly, no activity may yet have taken place under schemes approved at the latter end of the period. A further complication is that woods under ongoing management will have passed through successive schemes. That is, they may have been transferred from a BWGS to a WGS I and then onto WGS II to secure management grants. Often, work that was approved under one scheme was never actually done, and in such cases could have been re-approved under the subsequent scheme. Consequently, even the sum of 'approved activities' cannot be derived across all Grant Scheme types.

3.3 Woodland areas

Total woodland areas within a specified boundary could not be derived from the FC census (1984), as this only gave data for the whole county. Nor was it possible to use EN's Geographical Information System (GIS), since this only includes ancient woodlands at present. Using the relevant 1:25 000 maps (Sheets SO 44,45,54 and 55), planimetry was used to determine the precise area of all woods within the sample area which are > 20 ha. Smaller woods were divided into 5 size classes (by eye) and a score was made of the number in each. By allocating woods an area equivalent to the median of their size class and adding all together with those > 20 ha, an estimate of total woodland area was achieved.

It is unfortunate that there was no documented source of information at all on the breakdown of the *total* woodland area into conifers and broadleaves, nor into coppice and high forest.

The total areas of ASNW, PAWS and SSSI's were extracted from EN's GIS, by searching for grid references which were within the sample area. This also provided a list of named sites, and an updated version of the Ancient Woodland Inventory allowed all of these to be mapped

3.4 Grant scheme files

Inclusion of all schemes approved from January 1986 to the present meant that the following scheme types were covered:

Woodland Grant Schemes	Mark I	(WGS I)	June '88 - June '91
	Mark II	(WGS II)	June '91 - July '94
	Mark III	(WGS III)	Sept '94 - present
Broadleaved Woodland Grant Schemes		(BWGS)	July '85 - June '88
Forestry Grant Schemes		(FGS)	Dec '80 - June '88
Felling Licence Applications		(LAs)	1967 - present

(see table 4.6 for percentage of total woodland area covered by each scheme)

Each application for a woodland grant, once accepted, is given a reference number. This number refers to a file held at the local FA office. Stored in this file are the application form, any subsequent amendment forms, the contract, relevant maps, any claim forms, and all correspondence with the owner / agent or with consultees.

Since 1985, the layout and content of the application forms for each Grant Scheme have changed on several occasions. The exact documents and information stored will therefore depend to some extent on the era in which the application was made. For example, for Schemes prior to WGS, the completed application form became the binding contract, and was signed by both parties. Following the introduction of WGS II, the information on the application form was transferred to a database and a separate contract generated by computer. These later contracts also contained summary information not always given previously.

The location and coverage of each agreed application was recorded on 1:25,000 maps by the FA at each national office. Updated microfiche copies of these maps were then distributed to regional offices every 6 months. The last update was in mid 1995. Since then, all new applications have been entered on computer, from which up-to-date printouts of the maps can be produced as needed.

Schemes which have 'expired' (i.e. under which no more activity or payments are taking place) are archived. Their files are transferred to a different location, and they are drawn on a separate set of archive maps (also held on microfiche).

On all types of map, the scheme reference number is written beside the entry, and so it should be possible, by finding a wood on the map, to discover what schemes it has come under, and subsequently to trace the relevant files.

Only in the case of unconditional felling licence applications (which are not grants and under which no payments are made), is all the original information not available. Once agreed, these are destroyed, and only select summary information retained. The area of the operation under licence is no longer kept on record.

From microfiches and computerised maps, the reference numbers were obtained of all grant schemes and felling licence applications which have ever been approved in the sample area. By referring to summary schedules, or to the files themselves, only those schemes covering existing woodland and approved since the end of 1985 were selected. For example, if a file was retrieved which had been referenced from the microfiche and it was found that it only applied to areas of new planting, then it was not included in the study. Otherwise, all WGS and BWGS were included, since they existed only during the period concerned. Any FGS or LA, however, which was found to have been approved in or prior to 1985, was discounted.

In this way, the files for all schemes within the sample area approved since 1986 were traced.

3.5 Data from scheme files

In order to address the aims of this study (see Section 2), areas under different species, operations and designations were extracted from the scheme files. The type of scheme was also recorded, along with details of restocking claims (and hence actual felling). Further reference information (eg name of wood, date of approval) were also collected in order to ensure that the data could be double checked or audited. For each relevant individual scheme (ie approved application or contract), the following precise information was therefore copied from the files:

1. General information about the **scheme**:

   - type (whether, WGS I, II, III, BWGS, FGS, LA)
   - reference number (giving file location)
   - name of wood or estate
   - date of approval of the scheme
   - total area (ha) of existing woodland covered by the scheme
   - total area (ha) of restocking for which a claim was made (ie which actually got done)

   Most of this information was readily available from the contract, although any amendment forms had to be checked in case the total area had changed. The total area of claims had to be derived from the claim forms themselves.

2. Specific information about each **operation** within the scheme:

- operation (includes both activities and grants and so may be one of the following):

  - ❑ *Felling*
    CF Clearfell
    SF Select fell
    Fc Fell for coppice

  - ❑ *Thinning*
    T Thin

  - ❑ *Restocking*
    RS Restocking

  - ❑ *"Management"*
    MG Management Grant (Standard / Special / Annual : only WGS II and WGS III)

  - ❑ *"Other Land"*
    OL Other Land (an allocation in WGS II and WGS III for land included under the scheme but for which there is no activity and no grants in the WGS work plan. This could mean that activity is still underway under a previous scheme - e.g. BWGS or LA - or that the area is at least temporarily under non-intervention)

- species (whether conifers or broadleaves);

- area (ha) of operation.

The source of all this information varied with the Scheme type and the format of the contract. Before contracts began to be produced by computer, summary tables (providing total areas under each operation, broken down into broadleaf and conifer components) were often left uncalculated. Total figures therefore had to be derived from the list of work proposals by compartment. With the computerised contract (post-1991), such summaries were calculated automatically. In both cases, however, figures had to be adjusted for any amendments.

3. Specific information about any nature conservation **designations** covered by each operation:

- designation, which would fall into one of the following:

  - ❑ PAWS Plantation on Ancient Woodland Site (the site has been under forest since 1600, but the wood has been planted)

  - ❑ ASNW Ancient Semi Natural Woodland (the site has been under forest since 1600, and the wood does not obviously originate from planting)

  - ❑ SSSI Site of Special Scientific Interest (a separate designation, not mutually exclusive from either of the above).

- the component area (ha) of that operation under each designation.

The extraction of this data was more intricate. Information on which compartments were under which designations was sometimes given as a list in the application form, sometimes in a 'constraints check' carried out by the Woodland Officer dealing with the application, and was sometimes integral with the work proposals (as with current procedure). Invariably, the work proposals had to be referred to in order to extract the relevant areas and to link the designations to the operations.

4. Information on any restocking **claims** (for planting and/or natural regeneration) that had been made under the scheme, including:

   - the designations covered (see above)
   - species covered (whether conifers or broadleaves)
   - the component area (ha) under each combination of the above categories

   Information regarding claims had to be derived from the relevant claim forms, referring back to work proposals or compartment lists for designations.

Where only a proportion of the area covered by a scheme was within the sample square, that proportion was estimated and all areas, including those of all the different sub categories, were then reduced by an equivalent proportion.

The fact that the WGS represents a contract to do specified work and not a management plan constrained the type of data that was available. There was certain information which was required to address the project aims, but which could not easily or reliably be extracted from the files. Specifically, this included age class distribution and forest type (whether high forest or coppice). Planting years were generally given in WGS contracts, but only in the detail of the work proposals, with no summaries provided. To extract this data would have added enormously to the length of time spent on each file. Brief details relating to each management unit are also given in the work proposals and sometimes reveal the system under which it is being managed (e.g. coppice). This is not always the case, however, and could not be considered as a reliable source.

Conversely, some data not specifically mentioned in the brief was collected in order to improve the precision of the analyses. For example, the different types of felling were recorded separately. The areas specified for the thinning and management grant were also recorded, since these contributed to the total area for which 'active management' is prescribed, and this is usually somewhat less than the total area included in the scheme.

3.6 Database Structure and Analysis

All data was entered into 4 tables in a database (Microsoft Access 2.0). Tables were given the names shown in bold in the text below. For each application, there is just one entry in the "Schemes" table. However, there could be several entries in the "Claims" table and several entries in the "Operations" table for that application. Furthermore, for each operation, there could be several entries in the "Designations" table.

The tables were therefore linked by 'one to many' relationships as shown in Appendix 1. Code numbers were used to provide the physical links. Figure 3.2 shows an example of all the entries relating to one scheme. It should be referred to for the precise headings under which all data was recorded.

By utilising these relational and hierarchical databases, all the analyses could be carried out simply and rapidly. All the necessary totals and percentages derived for the various combinations of scheme, operation, designation and claim are presented in Section 4.

3.7 Maps

All schemes have been mapped on a 1:25 000 scale. This scale was chosen both because it is that used by the FA microfiche maps, and because it is of a manageable size for the sample square, with existing woodland shown clearly in green. Two Ordnance Survey 'Pathfinder' maps cover the sample square, and were pasted onto card to provide the base over which a series of overlays could be arranged.

The first overlay shows all PAWS, ASNW and SSSI designations, shown in red, green and dotted lines respectively. These were redrawn by eye from the Ancient Woodland Inventory updated to February 1996 (1:50 000) and the relevant SSSI map (EN, 1:150 000).

The second overlay shows all WGS applications, whether Mark I, II or III, all in black. These were taken from the 1:10 000 maps accompanying the applications.

The final overlay shows all LAs (in black) along with all FGS / BWGS applications (in blue). The latter two were taken from maps accompanying the applications and LAs were taken from microfiche.

All the overlays are purely to give an impression of the overall picture and distribution of schemes, and so applications are not referenced by number. They also give an impression of overlap, both between schemes of different types and between schemes and designations.

Using the overlays, it was possible to estimate the total area covered by any scheme without the double counting inevitable when using scheme data. This was done by overlaying a grid square, with lines drawn at the equivalent of every 500m, and counting the number of intersections which coincided with a scheme. The proportion of coincident intersections multiplied by the map area gave an estimate of total scheme area. Empirical observation suggests that this method is accurate to +/- 100 ha which is 0.25% of the study area.

In order to estimate areas of PAWS, ASNW or SSSI which are also under schemes, the same method was used, but intersections were counted only where coincident with both the designation and any scheme.

Figure 3.2 Example of data retrieved from a scheme file

Table : Schemes

ID code	Scheme type	Scheme number	Name	Date approved	Total area	Restocking: Area claimed
76	WGS I	42	Garnstone Estate	88	1.8	1.8
77	WGS I	163	Garnstone Hill Wood	88	3.9	1.8
78	WGS II	2162	Foxley Estate	91	416.8	14
79	WGS II	1529	Garnstone Estate	94	90	0

Table : Operations

ID code	Operation	Conifers / Broadleaves	Area of operation	Op code
77	RS	Conifers	0.2	244
77	RS	Broadleaves	2.5	245
78	MG	Conifers	127.8	246
78	MG	Broadleaves	247	247
78	OL	Conifers	17.1	248
78	OL	Broadleaves	11.2	249
78	RS	Conifers	4.4	250
78	RS	Broadleaves	8	251
78	T	Conifers	98.5	252
78	T	Broadleaves	109.1	253
78	CF	Broadleaves	12.5	368
79	OL	Conifers	6.2	254

Table : Claims

ID code	Designation	Area of claim	Conifers / Broadleaves
76	PAWS	1.4	Broadleaves
77	not ancient	0.2	Conifers
77	not ancient	1.6	Broadleaves
78	not ancient	4.4	Conifers
78	not ancient	9.6	Broadleaves
80	not ancient	0.2	Broadleaves
81	not ancient	0.5	Broadleaves
83	PAWS	1.1	Broadleaves

Table : **Designations**

Op code	Designation	Area designated
239	PAWS	1.4
246	PAWS	13.7
247	PAWS	26.4
247	ASNW	79
248	PAWS	1.8
249	PAWS	1.2
249	ASNW	3.6
250	PAWS	0.5
251	PAWS	0.9
251	ASNW	2.6
252	PAWS	10.5
253	PAWS	11.7
253	ASNW	34.9
368	PAWS	1.3
368	ASNW	4
254	PAWS	2.5
255	PAWS	4

Note : One application (described in the "Schemes" table) encompasses several operations. All or parts of each operation may fall under various designations.

For one application, a total area of restocking claims is given in the last column of the "Schemes" table. This area may be composed of various different species and designations. The breakdown is therefore given in the "Claims" table.

Code numbers provide links between related data.

3.8 Data limitations and problems

Despite the apparent simplicity of this analysis, the retrieval of data was much more difficult than originally envisaged, and required the use of various assumptions and simplifications. As a result, the data comes with several reliability warnings. Below, is a brief summary of the problems encountered and the assumptions made.

Approximations

In the larger schemes, in particular, the process of extracting the areas by operation, designation and species from the work proposals was restrictively time-consuming (taking 2 - 3 hours for some of the larger schemes).

In order to economise with time, a different approach was therefore taken:

- A summary of areas under different operations and species (adjusted for any amendments) was prepared.

- Total areas under each designation were calculated, and interpreted as a percentage of the total scheme area. (NB. In the case of ASNW, percentages were calculated using total broadleaved area, and were then only applied to the broadleaved component.)

The summary areas of operation by species were broken down further into designations by applying these percentages across the board.

As mentioned above, where schemes crossed the sample square boundary, a look at the overall scheme map (if available) allowed a visual estimate of the proportion of the scheme that was included. This percentage was then applied to all component areas.

Clearly it would have been preferable to identify more precisely both the area within the sample square and the actual operations or designations therein. However, this would have involved the following steps:

- Refer to maps accompanying the application (1:10 000 and not always grid referenced) and discover which compartments are within the sample square.

- Go to the list of work proposals and extract the areas, operations and designations for these compartments (also checking to see if amendments have been made since the contract).

- Calculate summary figures.

For the larger estates especially, this process was too time consuming to be practical, and so visual estimation was used as a pragmatic solution.

Missing Data

There are a few schemes about which nothing is known because their files could not be traced. It is thought that these should not give rise to much concern - the fact that they cannot be found suggests that they may have been cancelled. However, if one of the missing FGS schemes turned out to be relevant (i.e. post '85 and not simply new

planting), the summary FGS figures could be grossly wrong since at present, there are only 3 FGS schemes.

There remains some uncertainty as to whether or not further schemes exist in the sample square about which nothing is yet known. Scheme numbers were taken from microfiche maps. However, referral was made in certain files to previous schemes which had not appeared on the microfiches and yet work had been completed under them. Furthermore, previous schemes were not always recorded in the files. The extent to which this has introduced error into the results is clearly not known, although it is suspected that such occurrences were sufficiently infrequent that the broad results will remain unaffected.

Felling Licences are not kept on file if not conditional. For most of these, therefore, there is no easy means (other than cartographic) of telling where they applied to ancient woodland or SSSI.

Unreliable Data

For WGS II and WGS III, designations (PAWS, ASNW, SSSI) were consistently given for each compartment in the work proposals of the contract. However, for scheme types prior to June '91 (when the application form became the contract), designations may not have been recorded, despite the fact that a "constraints check" or accompanying correspondence suggested that designations applied. No one document provided a reliable source of this information. Furthermore, Woodland officers may also have added or amended a designation on the basis of site indicators, and not totally relied on the Ancient Woodland Inventory.

Figures for areas of claims were found by searching the file for claim forms. Some doubt exists as to whether all such forms were always present. (In one case, only 2 claim forms were found in a file - labelled "Claim 3" and "Claim 4").

More generally, there was no one consistent source for any category of information across all the files as application forms changed regularly in their layout and usage.

It was assumed but seldom checked, that the summary tables accurately reflected the work actually agreed, rather than being initial estimates supplied by applicants. While amendments were generally written into the work proposals on the Application form/Contract, the summary areas were rarely updated. Revising summary areas for amendments could prove particularly time consuming (for example, one scheme had 11 amendments!)

Problems associated with analyses

Percentages are preferable to areas in hectares when looking from the wider perspective. However, many of the resulting figures are too small, or have been derived from too few schemes. (eg the number of schemes contributing to the figure for Select Felling of broadleaves in SSSI's for BWGS is likely to be no more than one or two). Percentages involving combinations of operations/species/ designation are, therefore, not considered to be justified in this study.

Areas under designations within schemes represent estimates based partly on information gained from outside the sample square. Total areas under each designation, however, (supplied by EN Peterborough), are accurate figures. In an

ideal situation, percentages should not be calculated which use information from both sources.

Missing schemes - and potentially missing ones - make it difficult to estimate the level of accuracy to be expected from the results.

In that areas of Ancient woodland listed on the EN Inventory only include woods >2 ha, it could be argued that schemes covering <2 ha should not be included in the analysis. However, this would be potentially counterproductive, in that many schemes may cover less than 2 ha of a wood which is in fact >2 ha. Alternatively schemes covering >2 ha may only be conglomerations of woods that are in fact <2 ha!

3.9 Recommendations for Future Procedure

In view of the difficulties encountered in accessing and utilising data from WGS and other Grant Scheme files, some suggestions have been put forward in Appendix 2 on how the Grant Scheme data could be presented and stored in order to facilitate future studies of this type.

4. Results

4.1 Cartographic Data

The results of the analysis of areas derived from the map-based data are summarised below. Note that all figures refer to the sample area, unless stated otherwise.

a. **Total area of Woodland**

The combination of counting small woods in visual size classes and planimetering larger woods gave the following areas:

Size class	Area	%
< 2 ha	324 ha	11
2 - 5 ha	385 ha	14
5 - 10 ha	165 ha	6
10 - 20 ha	195 ha	7
> 20 ha	1,755 ha	62
TOTAL	2,824 ha	100

In round figures the total woodland area within the sample area is thus approximately **2,800 ha.**

Note that the smaller size class areas may have an accuracy of around +/- 10%.

Using 1:50 000 scale maps, the counting of grid square intersections which lay within the Hereford Plain Natural Area showed that 57 out of a total of 1035 coincided with woodland (5.5%). The total area of the NA is 103,800 ha, so applying this percentage suggests that estimated **5,700 ha** is therefore under woodland.

b. **Area of woodland under schemes (of any type)**

Using a systematic grid with a total of 1600 intersections, there were 77 intersections on woodlands under schemes, giving an area of approximately **1,900 ha.**

c. **Area of woodland under different designations**

Data provided from EN's GIS of Ancient woodland:

	In England	In Hereford Plain NA	In the sample area
ASNW	198,448 ha	2,075 ha	1,002 ha
PAWS	141,713 ha	1,098 ha	391 ha
SSSI[1]	50,174 ha	594 ha	333 ha
		(5 SSSI's)	(3 SSSI's)

Note that these 3 categories cannot be summed as SSSI's include ASNW and PAWS.

d. **Area of schemes (of any type) under different designations**

Counts of intersections on the grid square suggest the following broad figures:

ASNW **590 ha**
PAWS **310 ha**
SSSI **220 ha**

4.2 Scheme data

The data sourced from all the scheme files and entered onto the database is summarised in Table 4.1-4.5 below:

Table 4.1: Total areas (ha) and numbers of schemes

Scheme	Total number	Total area (ha)	Average scheme area (ha)
BWGS	17	291	17
FGS	2	88	44
LA	23	156	7
WGS I	23	268	12
WGS II	27	1343	50
WGS III	7	84	12
TOTAL	**99**	***(overlapping)***	**-**

Total areas cannot be summed due to the fact that woodlands are often transferred from one scheme to another. While the LA's largely cover woodlands outwith grant schemes, about half of the BWGS and FGS areas subsequently came under a WGS (often moving straight into WGS II). Nearly all the WGS I schemes were transferred into WGS II (presumably to take account of the new Management Grant).

[1] The area under the designation 'SSSI' represents the area of *woodland* under SSSI status. Figures supplied by EN represent only the area of ancient woodland under SSSI status. Since most SSSI woodland is ancient, this discrepancy is not seen as a significant source of error

WGS III is still limited in its coverage, but includes both new, previously unmanaged areas and woodlands coming out of WGS II.

Table 4.2 : Areas (ha) approved for different operations

Scheme	Felling	Thinning	Restocking	"Management"	"Other land"
BWGS	61	156	67	0	0
FGS	13	57	16	0	0
LA	23	130	0	0	0
WGS I	58	157	66	0	0
WGS II	80	816	90	1037	161
WGS III	6	70	8	46	4

Table 4.3: Areas (ha) under different designations

Scheme	ASNW	PAWS	SSSI
BWGS	65.4	36.3	48.9
FGS	2	0	0
LA	0	31.7	12.6
WGS I	77.6	32.8	67.6
WGS II	303.9	222.2	119.5
WGS III	7.1	59.1	0

Table 4.4: Areas (ha) under different species (derived)

Scheme	Broadleaves	Conifers
BWGS	291	0
FGS	47	41
LA	61	95
WGS I	190	78
WGS II	873	470
WGS III	24	60

Table 4.5: Areas (ha) of restocking completed: a. by scheme; b. by designation

a. by scheme

Scheme	Area restocked
BWGS	30
FGS	13
LA	0
WGS I	32
WGS II	35
WGS III	0
TOTAL	**110**

b. **by designation**

Designation	Area restocked
Ancient	30
SSSI	10

Note: The boundaries of the 3 SSSI's involved have remained unchanged over the period 1985-95. One was notified in 1975, the other 2 in 1986.

This data is represented in percentage form in Tables 4.6-4.10. However, some schemes have been excluded for various reasons:

- FGS does not feature, because the number of schemes was insufficient to provide meaningful percentages.
- The designations attached to most LAs are not known (files destroyed) and so LAs do not feature in Tables 4.8 and 4.10.
- All BWGS are broadleaved and so do not feature in the species table.
- Whether or not fellings are completed under LA's is not monitored, and hence these are excluded from Table 4.10. (Since it is a standard requirement to restock, however, it might be assumed that most of the actual fellings will be picked up by restocking claims under subsequent grant schemes)

Table 4.6: Percentages of total woodland area under each scheme

Scheme	% woodland area	number of schemes
BWGS	10	17
LA	6	23
WGS I	10	23
WGS II	48	27
WGS III	3	7

Table 4.7 : Percentages of each scheme area under different operations

Scheme	%Felling	%Thinning	%Restocking	%"Management"	%"Other land"
BWGS	21	54	23	0	0
LA	15	83	0	0	0
WGS I	22	59	25	0	0
WGS II	6	61	7	77	12
WGS III	7	83	10	55	5

Table 4.8 : Percentages of each scheme area under different designations

Scheme	%ASNW	%PAWS	%SSSI
BWGS	30	17	23
WGS I	36	15	32
WGS II	35	25	14
WGS III	10	80	0

Table 4.9: Percentages of each scheme area under different species

Scheme	% broadleaves	% conifers
LA	39	61
WGS I	71	29
WGS II	65	35
WGS III	28	72

Table 4.10 : Percentages of woodland felled and restocked under each scheme and each designation

Scheme	% woodland
BWGS	1.1
FGS	0.5
WGS I	1.1
WGS II	1.2
WGS III	0
TOTAL	3.9

Designation	% Area
Ancient	2
SSSI	3

5. Discussion & conclusions

5.1 Woodland Areas and Designations

The size class distribution for woodlands showed how medium to large sized woods (ie over 20 hectares) made up nearly two thirds of the woodland area. What this did not show is the area occupied by several very large woods in the study area. Around one third of the area was made up of just three woodland estates: Foxley, Garnons and Garnstone. The movement of these three estates between the various schemes thus had a major impact on all the total.

The analysis of size classes showed that more than 10% of the area is under the two hectare threshold used for compilation of the Ancient Woodland Inventory. If the ancient status of such woodland could be determined then the areas falling within the ASNW and PAWS categories would increase significantly. Indeed, it seems likely that this would bring the total proportion of the woodland that is ASNW up to 40%.

As expected, the analysis showed that the proportion of woodland that is ASNW in the Hereford Plain is well above the national average (Section 4.1c). Similarly, the proportion of SSSI's is unusually high (12% of the woodland area compared to 5% nationally), although as this is a figure compiled from only 3 sites, it should be treated with caution.

5.2 Management and neglect

Overall approximately two thirds of the woodland area was managed in some way or another, under one of the Grant Schemes, over the last ten years. This again appears high compared to national figures[2], given that the study area did not contain any Forest Enterprise woodland. It is recognised within the FA, however, that Hereford & Worcester have enjoyed an unusually high level of grant scheme activity over the period. Although a formal analysis was not carried out, it is clear from the maps - and no surprise - that the larger woodlands were much more frequently managed than smaller woods.

There is some suggestion that recent woodland and PAWS are more likely to be brought into management than ASNW's and SSSI's. For SSSI's, the difference is likely to be within the confidence limits of the analysis, but it is interesting that SSSI status did not appear to promote management, or at least entry into a Grant Scheme[3]. The proportion of ASNW remaining outwith grant schemes, however, was nearly twice that of PAWS. Without comparative data for the period pre-1985, it is clearly not possible to analyse the extent to which the Broadleaves Policy has affected the proportion of ASNW under management. It has been estimated for Herefordshire as a whole, however, that in 1985, nearly 70% of ASNW was not formally managed (CPRE 1989). This compares with the figure of about 40% derived in this study. It seems likely, therefore, that across the county, post-1985 schemes have brought a considerable proportion of ASNW into management. The figures should be treated

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[2] Forestry Commission Annual Report & Accounts, 1993-94, show that the average total area within grant schemes between 1st April 1991 and 31st March 1994 was 759,000 ha, or half of the private woodland area given in Forestry Commission Facts & Figures 1993 - 1994

[3] While the sample area includes only 3 SSSI's, these cover a total of 12 individual tenures, of which only 4 appear to have come under a grant scheme during 1985 - 95 (although parts of another 3 tenures received felling licences in this period).

with some caution, however, in that while one represents a snap shot in time, the other is derived cumulatively over a 10 year period. What *is* clear is that in the last 10 years, ASNW has not entered into grant schemes as much as other woodland.

5.3 Areas under Different Grant Schemes

WGS II was by far the most successful scheme in attracting applicants over this 10 year period, with nearly half the woodland area brought into it, and more than four times the area of any other individual Scheme. It seems likely that this is mainly a result of the attraction of Management Grants. However, there was also the fact that its timing and scope was right to pick up large estates which were coming to the end of their five year Dedication Schemes, following the removal of Income Tax relief in 1988. Similarly, it was an appropriate scheme, given its all embracing scope, to collect together areas previously split between FGS and BWGS, which again were coming towards the end of their five year life.

It is striking that only 3% of the woodland area is included in WGS III. This may be partially due to it only being in operation for just over a year, but it may also indicate that the very high uptake of WGS II has meant that 'saturation level', or at least a plateau of activity, has been reached locally.

The average area of the WGS II schemes was 50 hectares, compared with only around 10 hectares for WGS I and WGS III (Table 4.1). This reinforces the picture of the larger 'estate' woodlands being concentrated in WGS II.

It should be noted that FGS is insignificant in terms of approvals, but it should not be forgotten that many FGS's will have been current during the early part of this ten year period, but they have not been included in the analysis since they were approved prior to 1985.

5.4 Operations approved

Not surprisingly thinning was the most common operation, with between 60% and 80% of the area under each Grant Scheme being approved for thinning (Table 4.7). Unfortunately there is no way of ascertaining from the files what proportion of this work was completed. It must be acknowledged that applicants frequently included all areas which they *might* wish to thin in the scheme, and that very frequently only 60-80% of this may be completed in the five year plan.

The fact that 77% of the area included in WGS II was approved for Management Grants of one form or another is striking (Table 4.7). Owners are obliged to carry out the prescribed management in all areas receiving Management Grant. While, on occasion, this may have involved no more than allowing public access, this figure does imply that in the region of 70% of the area should receive active management during the plan period. However, the actual level of completion will not be known until these schemes reach the end of their five year plan, which in all cases lies just beyond the end of the study period. It is worth noting that in most cases Management Grant continues to be claimed annually. Between WGS II and WGS III, the figures suggest a reduction in the relative coverage of Management Grant, despite an increase in the proportion of area to be thinned (Table 4.7). In that only 7 WGS III schemes came under this study, these figures should be treated with caution. However, this *may* reflect the dropping of the Standard Management Grant, and also the stricter criteria for awarding Management Grants.

There is a striking difference between the proportions approved for felling, which were 15-20% under BWGS, LAs and WGS I, but only 6% and 7% under WGS II and WGS III respectively (Table 4.7). It is not surprising that felling rates were high under BWGS, since small areas to be felled were frequently transferred in isolation to this scheme. Increasing recognition of the sensitivity of ASNW, and greater use of continuous cover systems, may also have been contributory factors. However, the strength of contrast between WGS I and WGS II remains puzzling, with the former showing four times the felling rate of the latter. The scale of felling approved under WGS I is something of a concern, as felling nearly a quarter of the total area entered into this Grant Scheme over a five year period would have made a significant impact in the landscape of this Natural Area. Felling areas under WGS II and III are considerably more modest. However, the "appropriate" felling rate, whether in terms of silvicultural, ecological or landscape impact, cannot be proposed without information on the age class structure of the woodlands. This information is not generally included in grant schemes and was not covered by the Forestry Commission Private Woodlands Survey for the county as a whole.

5.5 Conservation designations and species

Table 4.8, which shows the proportion of woodland under different conservation designations which was entered into the various Grant Schemes, shows generally consistent trends. That is, none of the schemes appeared to have any marked additional appeal for owners of designated woodland. (The figures for WGS III are notably different, but should be treated with caution, given that they are derived from only 7 applications).

The drop in the percentage area of SSSI's under WGS II is perhaps surprising, given the general popularity of these Grant Schemes. However, again, this may simply be an anomaly arising from the fact there are only 12 SSSI tenures (or indeed prospective managers) in the study area and hence the data may not be showing genuine trends.

5.6 Felling and restocking completed

Of all the operations approved under the various Grant Schemes, the only one we can be sure has been completed is the restocking for which grant claims have been received. The difference between the areas approved for restocking and the areas on which a claim has actually been received is quite striking. Under BWGS and WGS I around half the area approved was claimed, and under WGS II this fell to just over a third.

It is likely that a significant area of restocking was completed but grant has not yet been claimed. It may well be that the true level of completion of felling and restocking is thus between half and two thirds of the area approved. While it must be recognised that in a small percentage of cases, claims are never made, and that in others, there may be some delay between the completion of restocking and the making of a claim (6 months might be considered a norm), it is unlikely that this would introduce a significant error to results drawn from over a 10 year period.

5.7 Felling rates

As mentioned in section 5.4 above, the amount of felling approved under WGS I does give rise to concern in terms of the 'rate of turnover' of woodland habitat which this implies across the Natural Area as a whole. On the other hand, the data on the areas actually restocked (and by implication felled) are much more modest. The felling

known to have been completed over the ten year period amounted to 4% of the total woodland cover and just under 6% of the total woodland covered by Grant Schemes . Allowing for restocking as yet unclaimed, it may be that these percentages would rise to 5% and 7.5% respectively.

The simple extrapolation of these felling rates can be used to indicate the rotation length or period for complete felling and restocking of all the woodland in the Natural Area. If 7.5% has been felled over a ten year period, then it will take 130 years before all the existing woodland has been felled and restocked.

Without any knowledge of the age class distribution of the woodlands it is inappropriate to subject such projections to too much analysis and interpretation. Certainly the extent to which 'normal' forest conditions apply cannot be ascertained. Suffice to say 130 years exceeds the commercial rotation length for most of the broadleaved species, but clearly is at least double that expected for most of the conifers. Once an allowance has been made for the significant proportion of the woodland area which must be conifer plantation (about one third of the area under WGS II was coniferous) , the actual rate of turnover in the semi-natural areas will be significantly lower. Indeed the replacement period may approach 160-170 years.

These rates are sufficiently low that they do not constitute any significant threat in terms of continuity of habitat across the Natural Area as a whole, although obviously the rates of change within individual woodlands could be more dramatic depending on the precise fellings approved.

5.8 Comparison with hypothetical strategic objectives

The Project Brief requested a comparison of the management activity revealed by this study with a series of hypothetical 'strategic objectives' or scenarios for ASNW in the Natural Area. These are listed in section 4.2.8 of the brief (see Appendix 3) in the form of areas or percentages of ASNW, and these are summarised below:

a. 20% minimum intervention, to include one large wood
20% coppice or coppice with standards
60% high forest

b. 20% minimum intervention as above
50% coppice
30% high forest

c. 50 ha of minimum intervention in a compact block or area
100 ha of coppice in a compact block or area
and the remainder as high forest

Scenarios (a) and (b) both propose that 20% of ASNW should be in minimal intervention (i.e. excluded from schemes). Figure 4.5 shows that double this amount is in fact currently excluded. It is also proposed that this should include at least one complete wood from the largest size class available. Two individual woods satisfy this criterion: Friar's Grove (GR 4951) and Gates Wood (GR 5050), each over 25 ha. However, over 100 ha of Wellington Wood (GR 4850) as well as contiguous areas of more than 20 ha of Badnage Wood (GR 4547) and Merryhill Wood (GR 4445) also remain "unmanaged" parts of larger woods.

Scenario (c) takes a different approach by specifying the area rather than the percentage to be assigned to minimum intervention and also specifies this should be in as compact an area as possible. In that the sample area only consists of four 10x10km squares, it is not possible to assess with any confidence the degree to which this criteria may be satisfied across the Natural Area as a whole. More than half of the total woodland in the sample area lies in the SW block, where Wellington, Badnage and Merryhill Woods are all to be found. Friar's Grove and Gates Wood, which are also unmanaged, are situated in the NW block. In the NE block, there may be something approaching 50 ha of unmanaged ASNW, but this is composed of many small isolated woods - in keeping with the nature of the woodland cover here. In the SE block, there is very little in the way of woodland cover, anyway, and the total area of unmanaged woods does not reach 50 ha, irrespective of whether or not it is ASNW. One can thus conclude that two of the four squares satisfy this criteria, but a full assessment of this kind of scenario would require looking across much greater areas.

With regard to the proportion of ASNW which should be managed under coppice or high forest systems, it is disappointing that information is seldom given on the silvicultural systems under which WGS areas are being managed. While it may occasionally be revealed in the detail of the contract, the applicant is not required to submit this in writing. He/she need only stipulate the operations which will be carried out in the wood. Clearly, the operation "Fc" (= Fell for coppice) reveals that coppicing is taking place. However the associated areas will be of the individual coupes to be cut, and do not indicate the total area being managed under coppice regimes.

The total number of "Fc" proposals is, in fact, negligible, over this 10 year period. This would suggest that the proportion of ASNW being managed under coppice is minimal. The majority of the ASNW which is managed, is thus most likely to be under a high forest regime.

In broad terms, therefore, 60% of the ASNW in the sample square is managed high forest and 40% is under minimal intervention. This most closely approximates to Scenario (a), except that far from 20% existing as managed coppice, it most probably exists as neglected coppice within the minimum intervention category. The grant schemes certainly do not appear to have encouraged significant areas of coppice back into management.

It is worth emphasising, however, that while this study has analysed the cumulative effects of grant schemes over the past 10 years, the nature and emphasis of these schemes has been continuously changing. The newest addition since 1995 has been the new Woodland Improvement Grants (WIG). WIG II is designed to encourage the management of currently undermanaged woods (many of which are ASNW), while WIG III is intended to encourage biodiversity. Coppice regimes in ASNW may therefore be stimulated by both these schemes, but particularly the latter.

5.9 Further work

The aims of this project as set out in the brief were, admittedly, ambitious. It is, nevertheless, disappointing that some of the most fundamental issues - such as the balance between ages and felling rates, or the areas of different silvicultural systems - could not be fully addressed. The problem arises from both the lack of some data and of the majority of the information. The manual analysis of Grants Schemes files is difficult and time-consuming. Although WGSII onwards are produced from the FA database, the structure of the database, the constraints on the interrogation of it, and

the continued use of paper records, all limit the extent to which it could be used for this study. However, as the system is improving all the time it is clear that there is great scope for increasing the use of the WGS computer database in the future.

It is clear that carrying out this study on such a small area has not been very productive. There is not sufficient data to draw firm conclusions which can be applied elsewhere, nor to establish trends that can be extrapolated. However, given the point above on the inaccessibility of the WGS data, it is unrealistic to repeat this study on a larger scale which would enable such trends and patterns to be established with confidence. Such a larger-scale study will have to wait until WGS records are more readily accessed and analysed directly from the database.

6. References

CPRE. 1989. *Herefordshire Woodlands & The Broadleaves Policy, 1985 - 88.* Hereford: CPRE.

FORESTRY COMMISSION. 1984. *Census of Woodlands & Trees, Great Britain, 1979 - 82.* Edinburgh, Forestry Commission.

FORESTRY COMMISSION. 1993. *An Assessment of Standards in Grant-Aided Woodland Planting.* Canopy. Edinburgh, Forestry Commission.

NCC. 1986. *Herefordshire Inventory of Ancient Woodland (Provisional).* Peterborough, Nature Conservancy Council.

Appendix 1

Structure of Database

(all relationships one to many)

Schemes	Operations	Designations
	Op code	**Op code**
ID code	ID code	Designation
Scheme type	Operation	Area designated
Scheme number	Conifers / Broadleaves	
Name	Area of operation	
Date approved		
Total Area	**Claims**	
RS Area claimed		
	ID code	
	Designation	
	Area of claim	
	Conifers / Broadleaves	

Note: "ID code" is a code number that identifies a unique record (application) in the Schemes table
"OP code" is a code number that identifies a unique record (operation) in the Operations table
(These codes act as the 'links' between the tables)
The remaining headings are fully explained in Section 3.5 of this report.

Appendix 2

Recommendations for Future Studies and Procedures

Introduction

Studies of this type are clearly limited by the problems associated with accessing data. At present, they are simply too time-consuming to be feasible on a large scale, and to allow for precision in methodology.

All the information required for a relatively detailed analysis of the contribution of WGS to nature conservation objectives is currently contained within WGS contracts and files. The layout allows woodland officers to retrieve that information which is relevant to their needs, but retrieval of the information required for wider analyses is prohibitively time consuming - a simple breakdown into areas of ASNW, PAWS and SSSI under different operations taking up to half a day for single large schemes.

If the contribution of WGS to nature conservation is to be evaluated or monitored on a wider scale, then the relevant data needs to be recorded in a format that allows for more rapid retrieval. Recommendations are given below of changes to the current system which would ease future studies and allow them to be carried out over larger areas, which should give more significant results.

Recommendations

1. **Local use of WGS Database**

   All information regarding scheme contracts is now entered onto a database. (All WGS Mk III and most of WGS Mk II are already computerised). This is used to print copies of the contract which includes work proposals by compartment and summary tables of areas of operations and areas under grants. There is also a 'Dataquery' facility which allows appropriately trained local staff to obtain various other summary information. However, the continued existence of many schemes which pre-date computerisation ensures that scheme handling still relies heavily on a paper system. Consequently few staff have as yet had the opportunity to become familiar with the database, and it was not used in this study.

   In theory, a modern database should easily be able to provide regular, updated summaries of all kinds of information contained therein, which must otherwise be laboriously extracted from filing cabinets. It would be prudent to ensure at an early stage that the present system will be able to accommodate the kind of questions addressed in this study, in order to allow future local assessment of the contribution of WGS to the realisation of nature conservation or other scheme objectives.

   The use of a Geographical Information System (GIS) could further provide information which would be invaluable in assessing the impact of WGS on the scale of the landscape. The degree to which the distribution of operations across a wider area is sensitive to ecological or landscape considerations could potentially be assessed. In that EN Peterborough is already running a GIS which includes the information held in Ancient Woodland Inventories, a compatible GIS covering grant schemes would provide potential for many more wide-ranging analyses.

2. Summary Tables

The summary information contained within the contract is derived by computer from the work proposals. This has the advantage that it is calculated, and is therefore not subject to 'guessing' by the applicant, or indeed, total omission - as was often previously the case. Subsequent amendments to contracts are also entered on computer, with the distinct advantage that summaries should always be up-to-date. It is understood that the database should at any time be able to provide summaries (from WGS II onwards) of:

- areas of designations
- felling areas, not only broken down by species (conifers / broadleaves) but further still into types of site and designations
- areas (broken down as for felling, but further showing when restocking is with native species)
- planting year, to allow assessment of age structure

3. Work completed

This study has been limited to analysing work approved for completion, but no figures have been available on work completed. It has therefore only been possible to analyse, as a 'snapshot' in time, the *potential* and not the *actual* effect of WGS. Furthermore, it is the experience of woodland officers that a fair proportion (perhaps one third) of work that is approved never actually gets done.

It would therefore be of great use for future evaluations if their were a record kept of work actually done on completion of the 5 year period of the scheme. All schemes are inspected on their completion, either by a woodland officer or a contractor. Such a record should therefore develop, and the applicant could be required to provide more quantitative information such as exact areas (e.g. before the final payment of management grant, or certainly before approval of another application). This information should be recorded in a format similar to the work proposals such that summary information identical to that described above can be derived.

4. Grants actually paid

Finally, it should be possible to draw up summaries not just of work completed, but also of grants paid under a scheme, and of the *area* to which they apply (i.e. not just the amounts). At present, claim forms must be sought from within the scheme file, and the necessary information extracted manually. The computer should make the task considerably easier, provided that payments are appropriately linked to grant applications in the database structure.

Appendix 3. Project specification and invitation to tender

English Nature Lowlands and Three Counties Teams joint special research project 1995/96-1996/97 in conjunction with the Forestry Authority Wye and Avon Conservancy

Action Programme: **Developing Natural Areas AP1**

Project Title: **Policy evaluation of the Woodland Grant Scheme (WGS)**

Start date: **1 January 1996** **Finish date:** **30 October 1996**

1. Background/rationale

1.1 The aim of Natural Areas (NA) special projects is to take forward the wider Natural Areas approach through:

- consolidating current knowledge about nature conservation at the NA level;
- helping to set the agenda, establish priorities and assist the necessary focus on issues of significance for nature conservation;
- securing legitimacy and support by encouraging inputs from external agencies with relevant concerns, interest and knowledge;
- providing the basis for promoting nature conservation to the wider community.

1.2 This project seeks to demonstrate policy evaluation of the WGS as a mechanism for realising NA level and site level woodland nature conservation objectives. It also aims to investigate the potential for a partnership approach to the operation of the WGS that follows principles of environmental sustainability and recognises the environmental goals and responsibilities of both FA and EN. The following brief outlines the project aims and proposed methods.

1.3 It is an explicit principle of national forestry policy as implemented by FA that managed woods are more likely to survive and contribute to multiple use objectives than unmanaged ones, and hence that ultimately nature conservation objectives are likely to be best met by expanding the number and area of woodland within the WGS. In recent years the WGS has increasingly demonstrated its value as a means of securing beneficial management of ancient and semi-natural woods. For its part, therefore, EN continues to support the use of grant aid as the main incentive for creation and management of woodland but seeks to identify and promote ways in which grant can be used most effectively to benefit nature conservation.

1.4 In pursuit of the strategic objective of positive management of all SSSI owner/occupier holdings by 2000, EN's Local Teams are identifying the tenure units where conservation objectives can be delivered through the WGS and encouraging entry to the scheme through, for example, the negotiation of Site Management Statements. Faith in the scheme for this purpose requires an objective look at real outcomes, their conservation effects - for good or ill - and the lessons relevant to future operations and FA/EN policy and practice.

1.5 The Authority wishes to have better knowledge that their approved silvicultural prescriptions are, in fact, having the desired conservation end result, and to identify

illustrative examples of sites/schemes which demonstrate what has worked well, or not. There is also interest in a study which might help to inform a more discretionary use of the WGS as a management incentive. An indirect benefit might be recommendations for future monitoring prescriptions for the evaluation of the conservation effects of WGS management by FA staff.

1.6 However, there are other approaches, eg minimum intervention and parkland/wood pasture management which cannot be incorporated in the WGS, while on some sites the practical application of the scheme may not allow sufficient attention to the particular special interest, such that EN would prefer an alternative means of implementing desired conservation management. The geographical context is also important, for instance the widespread adoption of standardised prescriptions, especially felling, could lead to major simplification and loss of woodland diversity at a landscape level. There is a need to provide continuity of enough managed woodland of the right structure to support dependent species across their natural range.

1.7 This project, together with the 1995/96 woodland SSSI sample survey and FA's 1995/96 national WGS audit, should inform the assessment of the actual benefits of WGS for management of SSSI special interest features and for the management of the ancient woodland resource at the landscape scale (county, district or NA). The findings might also have wider relevance to appraisal of aspects of the Government's forest biodiversity policies as stated in *Sustainable forestry - the UK programme.*

2. Aims

2.1 To evaluate the effectiveness of the WGS for its contribution to sustainable management of SSSIs.

2.2 To evaluate the effectiveness of the WGS for its contribution to realisation of woodland conservation objectives at a Natural Area level.

2.3 To assess the potential for FA/EN partnership in delivering common sustainable woodland management goals.

3. Objectives

3.1 To determine the consequences of WGS management for woodland SSSI conservation objectives through assessment of interest feature condition/status pre and post management for a sample of SSSIs in Wye and Avon Conservancy.

3.2 To compare the approaches and conservation outcomes from WGS across a range of ancient woodlands (encompassing NAs, habitat, management regime and tenure categories) within a single Conservancy.

3.2.1 To assess the extent to which schemes have affected and are sensitive to the conservation resource of an area, through determining for one or more trial areas the coverage of ancient woodlands by forestry schemes and their cumulative impact on the woodland age class distribution in space and time (the 'normal' forest, as per G.F. Peterken 1981 *Woodland conservation and management*, p. 274).

3.2.2 To compare the consequences and implications of the above with a range of different sets of possible strategic conservation objectives for the area(s).

3.3 By these means:

a. to test the assumptions that underlie EN's support for forestry grant aid for woodland conservation by acquiring information on the strengths and weaknesses of the system on the ground

b. to inform the FA's five yearly WGS approved management plan reviews and thinking on possible use of the WGS on more discretionary lines.

4. Methods

As funding for the project has to be sourced from two financial years' budgets and in phases, it is necessary for the work to be done in stages. This will mean the letting of the contract in two stages, with the second stage subject to review and potential reassessment with a revised project specification, taking account of the first stage experience and contract outputs.

It is anticipated that a significant staff time contribution will be available from the FA for the accessing and preliminary analysis of WGS documents, assisting with ownership details and maybe obtaining access permission to sites. Some similar help can be assumed from EN for the location and copying of survey data.

The first stage, to be financed in FY 95/96 involves

a. the drawing up of a whole project design, and

b. the undertaking of necessary preparatory work and approximately one third of the survey of selected sample sites (sufficient to reasonably trial the method in the field and evaluate a group of woods which lend themselves to winter appraisal).

The second stage to be financed in FY 96/97 has the bulk of the fieldwork, desk study of the sample area(s) and full report.

The contractor will be asked to utilise and carry out the following work to meet the project objectives.

4.1 Sample sites

4.1.1 From the national and local FA records and EN ancient woodland inventories/SSSI data identify a sample of 20-30 sites with completed (or largely so) WGS.

4.1.2 Select a sample which encompasses

- SSSI and non-SSSI of comparable quality
- ASNW and ancient replanted
- a range of NAs (there are 17 in Wye & Avon Conservancy)
- different categories of owner (traditional estate, farmer o/o, public body, FE and voluntary body etc).

4.2 Sample area

4.2.1 Check with FA the availability of information (preferably in map form) on scheme locations within one or more trial areas of *c*400 sq kms (candidate trial areas to be identified by FA/EN for discussion with the contractor.

4.2.2 Select with local staff the first trial area which should be all or part of a NA, with a reasonable amount of privately-owned semi-natural woodland within it.

4.2.3 Overlay extant scheme boundaries on ancient woodland maps and calculate how much ancient replanted and ASNW is within schemes of different sorts.

4.2.4 Locate the details of a sample (or all depending on numbers) of Dedication scheme plans/BWGS/WGS approvals since 1988 (the year the WGS was introduced) on ASNW woods and calculate for each the average area felled per five year period and the average area of woodland within the scheme. (Note if schemes include a mixture of coppice and high forest, separate the two out and calculate an average felling rate for each).

4.2.5 With local staff, agree likely rotation lengths for the average high forest and coppice stands in the sample area.

4.2.6 Assess the degree to which 'normal' forest conditions apply, ie where all age classes are present in proportions which, for the sample woodland area and chosen length of rotation, will maintain the existing age distribution of stands indefinitely, thus:

Area of woodland within scheme = average felling rate (ha/yr) rotation length.

4.2.7 If normality does not apply calculate (a) how much extra woodland would need to be brought in to maintain the average felling rate or (b) what would the average felling rate need to be reduced to (assuming little option on reducing rotation lengths).

4.2.8 Utilising the above, establish the extent to which the present nature and distribution of schemes allows the following set of (hypothetical) strategic conservation objectives to be met. All percentages are by area.

Scenario (a) 20% of the ASNW to go into minimum intervention (ie excluded from schemes) including at least one complete wood from the largest size class available.

20% coppice or coppice-with-standards.

60% managed high forest.

Scenario (b) 20% minimum intervention, as above.

50% coppice.

30% managed high forest.

Scenario (c) In each roughly 10x10 ha block there should be about 50 ha assigned to minimum intervention in as compact an area as possible. If it cannot be done in a single wood a cluster of woods as close together as possible should be selected.

About 100 ha should be assigned to coppice again keeping it to as compact an area as possible.

If the above can be satisfied, what area of ASNW is then left for managed high forest.

4.2.9 Assess the locational and structural sum consequences of grant-aided management for the realisation of illustrative conservation targets and identify the nature and scale of activity required to achieve these. (The analysis should consider the woodland conservation objectives from core or full NA profiles, if available.)

4.3 The above are **not** intended as blueprints for what EN actually wishes to achieve but as ways of exploring how the existing pattern of schemes may or may not constrain future options and suggest strategic considerations in scheme promotion. Other scenarios might be added or the approach might be repeated in a different area, data and time permitting.

5. Outputs

5.1 Stage 1

5.1.1 A project design utilising the above, defining the study sites/areas, the field and analytical methods and evaluation process, the time frames and resources required. Information Technology options should be included, eg use of MapInfo software.

5.1.2 Completed survey reports and provisional analysis for approximately 10 sites.

5.2 Stage 2

Reports, maps and sets of field survey documents drawing together the information collected in the surveys and analyses and describing the results; to be produced for publication in EN's Research Report series. Other forms of publication are to be agreed later. A copy of the report on a word processor disk will be supplied. The consultant will give a presentation on the project to EN and FA staff.

6. Proposed timetable

Project brief agreed between EN and FA by 30 November 1995.

Tenders drawn up by EN Three Counties Team for Stage 1 and let by 31 December 1995.

Project design agreed and first Stage of sample sites work completed (data accessed, survey methodology drawn up and survey part undertaken) by March 1996. Payment on receipt of first Stage report.

Meeting with steering group and review of tender for Stage 2, to be let by April 1996.

Second Stage of sample sites survey completed, discussion of results and draft analysis. Review of data suitability of sample area selection. 30.6.96.

Desk study of sample areas and presentation of preliminary findings. 15.8.96

Draft full report with data sets submitted for steering group comment, with any proposals for follow-up work (interim second Stage payment). 30.9.96

Revised full report submitted. 15.10.96

Final report copies and all outputs received and final second Stage payment. 30.10.96

Presentation of study to FA/EN staff. November 96

7. Project management

7.1 The nominated project officer will be Mark July, Senior Conservation Officer for the Three Counties Team. An EN/FA project steering group will meet at intervals and comment on draft outputs. A meeting will be held with the project officer to confirm the requirements of the project before work commences. Thereafter verbal reports of progress will be expected regularly. It is anticipated that the steering group will wish to discuss with the contractor the draft project design, the results from the first Stage of site appraisals and the draft final report.

8. Useful material/references

- WGS and preceding grant scheme documentation
- NCC Phase 2 woodland survey methodology
- EN Site Objective Statement/Site Management Statement formats.
- Lorrain-Smith & Walker (1993) *An assessment of standards in grant-aided woodland planting*. Report of a survey carried out for the Forestry Commission.

English Nature
Malvern Office

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