

INFORMING WOODLAND POLICY IN ENGLAND

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Introduction

If information is to be used in the process of policy making, it must be in an accessible form. Not only does the policy maker need to be aware that information exists, but the information must also be presented in an appropriate format. Information might be rejected in a policy scenario for a number of reasons: incomplete coverage, reliability unknown, and comparison with information from other sources is difficult. The case study demonstrates the potential application of the Countryside Information System (CIS) in meeting the needs of policy advisors by asking a simple question, “How much woodland is there in England?” The differences between the various data sources and the possible implications for policy makers are discussed.

The Policy Framework for Woodlands in England

The *England Forestry Strategy* published by the Forestry Commission in 1999 sets out priorities for woodland creation in England and the UK Government’s forestry policy. The policy has two main aims (i) the sustainable management of the existing woods and forests and (ii) a continued and steady expansion of the woodland area to provide more benefits for society and the environment. To help implement the Strategy, the Government needs good quality information about woodlands, and the Forestry Commission is to publish a National Inventory of Woodland and Trees to provide better information about England’s woodland resources.

Comparison of woodland data sources

Three sources of data with information about woodland are currently available in CIS format. The first source is output from the Ordnance Survey’s 1995 digital 1:250,000 Strategi data, customised for use in CIS. The second source is the Land Cover Map of Great Britain (LCMGB) derived from satellite imagery and produced by the Institute of Terrestrial Ecology. The third source is the results of the Countryside Survey 1990 (CS1990), a sample survey of land cover and vegetation, the results of which are available in CIS format.

In addition to these sources, the Forestry Commission produces annual statistics of woodland in Great Britain, encompassing Forestry Commission and private woodlands, though these are not available in CIS format. However, the results of the National Inventory of Woodland and Trees, including statistics on forest types, tree species, and management, will be made available in CIS format.

Four estimates of the area of woodland derived from these sources are shown in Table 1 below. The estimates range from 0.66 ha to 1.09 ha, highlighting a problem often experienced by policy advisors of deciding which estimate to use when different sources give different answers. Table 2 contrasts the main strengths and weakness of the different woodland sources. Frequently there is no right or wrong answer to this question, since differences may relate to more than simple “accuracy”. There are some general temporal, spatial and methodological issues that need to be considered when comparing data from different sources and these may explain the differences.

Table 1: “How much woodland is there in England?”

Source	Estimated area of woodland (million ha)
OS Strategi	0.66
LCMGB	0.98
Forestry Commission Statistics 1989-90	0.96
CS 1990 Sample Survey	1.09 ± 0.09

Table 2: Comparison of some woodland data sources.

Source	Description	Strengths	Weaknesses
Ordnance Survey Strategi data	OS have created a CIS data set by calculating the density of 13 attributes per kilometre square from their 1:250,000 Strategi database.	A national survey being continually refined.	OS data are collected over a time period, and its accuracy at any one time will depend on the most recent revision in the area concerned (woodland has a lower priority than features such as roads and urban areas)
ITE Land Cover Map of Great Britain	Classification of multi date Landsat Thematic Mapper data. Land cover is recorded in 25 classes based on spectral temporal signature. Initial classification verified against field observations and refined using knowledge based contextual processing.	Satellite imagery permits a comprehensive survey of land cover to be undertaken in a short period.	Limitations in interpretation of these data. Problems of cloud-free image availability.
CS1990 Sample Survey	From detailed surveys of land use and vegetation in a sample of 1km squares, estimates are made for the whole of GB. The selection of sample sites is random within the framework of the ITE Land Classification. This is an objective classification of all 1km squares in GB into 32 Land Classes through statistical analysis of a range of environmental parameters.	Detailed ecological and management information not available from other surveys. Collected in a single field season. Measurement of change.	Cannot provide spatial distribution at the local scale.
Forestry Commission Statistics for 1989-90	The estimate is based on a 1980 census of woodland, updated since then in light of changes to the Commission’s holdings and grant applications for private woodland.	A comprehensive estimate based on available Commission records.	May be inappropriate for some purposes, e.g. lacks botanical information.
Forestry Commission National Inventory of Woodlands and Trees	A national survey of Great Britain started in Scotland in 1994. The main woodland survey should be completed by March 2000 and the small woodland survey by March 2001. Results will be released as Inventory Reports on a regional basis in Scotland and on a county basis in England and Wales. The results will be made available in CIS format.	A definitive and comprehensive survey covering woodlands of 2 or more hectares, and small woodlands, groups of trees and individual trees. Preferable to any of the other sources above, for almost all purposes.	To be determined.

Temporal issues

Target year – were the surveys carried out in the same year.

Time of year – were the surveys carried at the same time of year? Features can have very different appearances in different seasons and may affect the quality of recording.

Time of day – even the time of day may influence how information is recorded, especially when using remote sensing platforms such as satellites and aircraft. Shadows and angle of incidence of light are key factors here.

Spatial Issues

Scale and raster recording – data collected at one scale (e.g. 25 x 25 m pixel in a satellite image) may give more detailed information than data collected at a whole field level. In the latter case, real spatial separations may be ignored in the interests of generality.

Gradients and mosaics – different surveys may detect different arbitrary divisions along natural gradients in vegetation (e.g. where coniferous woodland may grade into heathland). Similarly, real vegetation mosaics may be interpreted differently between surveys.

Geometric registration – not all mapped information (e.g. from satellites) is necessarily registered in exactly the same way to the national grid. Small spatial differences can lead to different results being obtained.

Cartographic representation and generalisation – maps and other spatial representations of the land survey may vary in their representation of objects on the ground (e.g. a young plantation in the uplands may be described by its land cover-heathland-or its land use-forestry).

Methodological Issues

Objectives, perception and nomenclature – different surveys may have different objectives leading to different emphasis being placed on the way information is recorded. A survey designed to give information of use to wildlife conservation agencies may record rare species in greater detail than a more general geographical survey, for instance. Different disciplines of study may use the same terminology for slightly different features (e.g. how is mixed woodland defined?)

In addition to the ability to calculate estimates from data sources, the CIS allows a user to make spatial comparisons, using a region or data set overlay facility. To illustrate this, two regions have been created by selecting 1 km squares in England with a total woodland area of 10 ha or greater according to the LCMGB and OS Strategi data sets. For the LCMGB two data sets, “coniferous woodland” and “deciduous woodland”, have been combined to make a data set equivalent to the OS Strategi “woodland”. A region overlay map for the two regions is shown in Figure 1, with the degree of “overlap” and “non-overlap” by English County given in the data window.

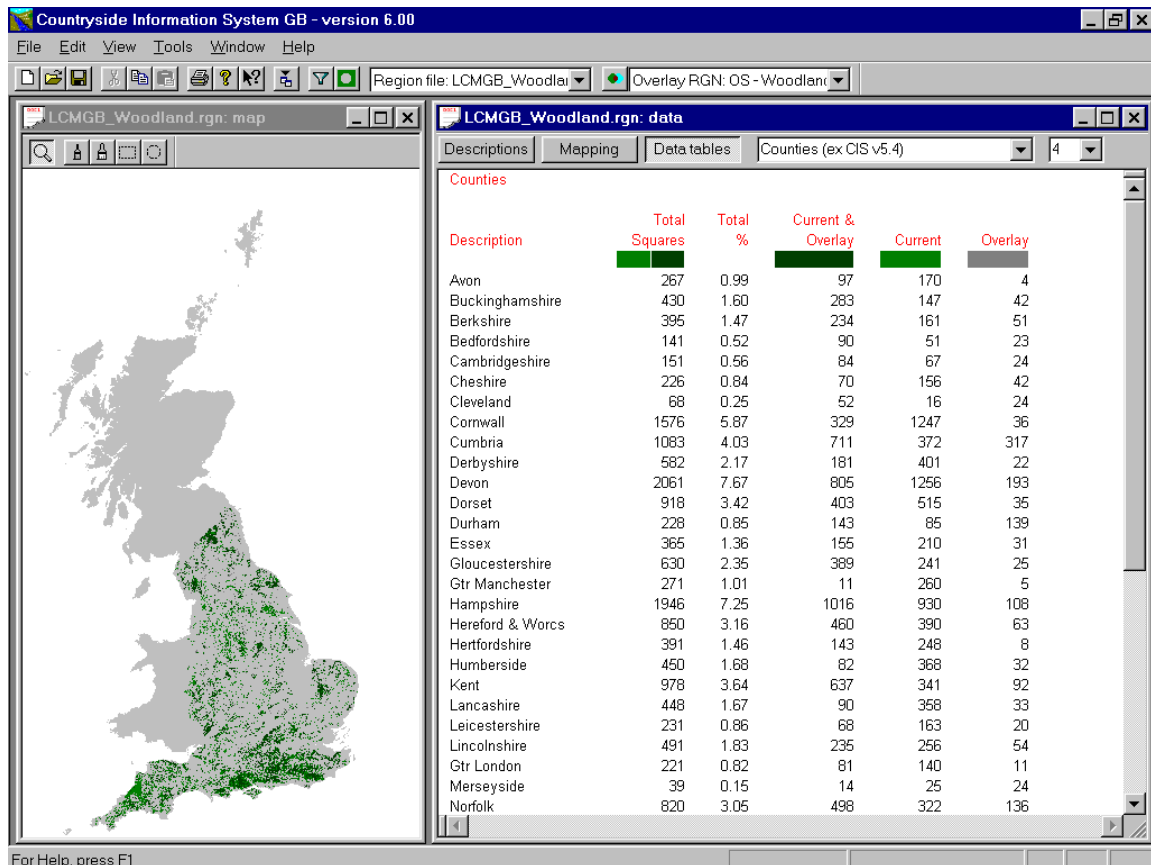


Figure 1. Comparison of the spatial distribution of woodland in the English Counties from the Land Cover Map of Great Britain and Ordnance Survey Strategi data.

The area of overlap (*i.e.* squares labelled as “Current & Overlay” in the data window) is coloured black and accounts for about 47 per cent of the total number of squares in both regions. In East Anglia agreement between the data sources is good for large areas of conifer plantation, such as in the Thetford area. Squares coloured green and labelled as “Current” are those for which the LCMGB estimates that there is more than 10 ha of woodland, but the OS Strategi does not: these amount to about 52 per cent of squares in both regions. Squares coloured grey and marked as “Overlap” are those for which the OS Strategi data estimates that there is more than 10 ha of woodland, but the LCMGB does not: these amount to about 10 per cent of squares in both regions. The total LCMGB estimate for England was greater than that that from OS Strategi (see Table 1) and this is reflected in the wide scatter of these squares across East Anglia, presumably representing smaller woodland patches detected by the satellite.

Representation of sample surveys in CIS

An additional feature of the CIS is the ability to view data collected by sample survey. Full “census” surveys, such as OS mapping or the LCMGB, estimate the area and spatial distribution of woodland but are restricted in the additional information, which they can provide about say, woodland age or usage. Thus for some applications sample data may be the only source of information available.

Countryside Survey 1990 is an example of collecting environmental data by sampling. The woodland land cover results from CS 1990 are available in CIS as the five reporting classes: conifer, mixed, broadleaf, shrub and felled. Additional information was also collected, including detail of species composition, age, management condition, evidence of use and some additional woodland features. The results of the analyses of these further data are now available in CIS format. As an illustration of the use of CIS to explore sample data, Figure 2 shows the estimated amount of woodland in England for a number of different categories including dominant species, age of woodland, condition of woodland, use of woodland and additional features. From these data, for example, it is estimated that 53 per cent of woodland in England was being actively managed in 1990, compared to 63 per cent nationally.

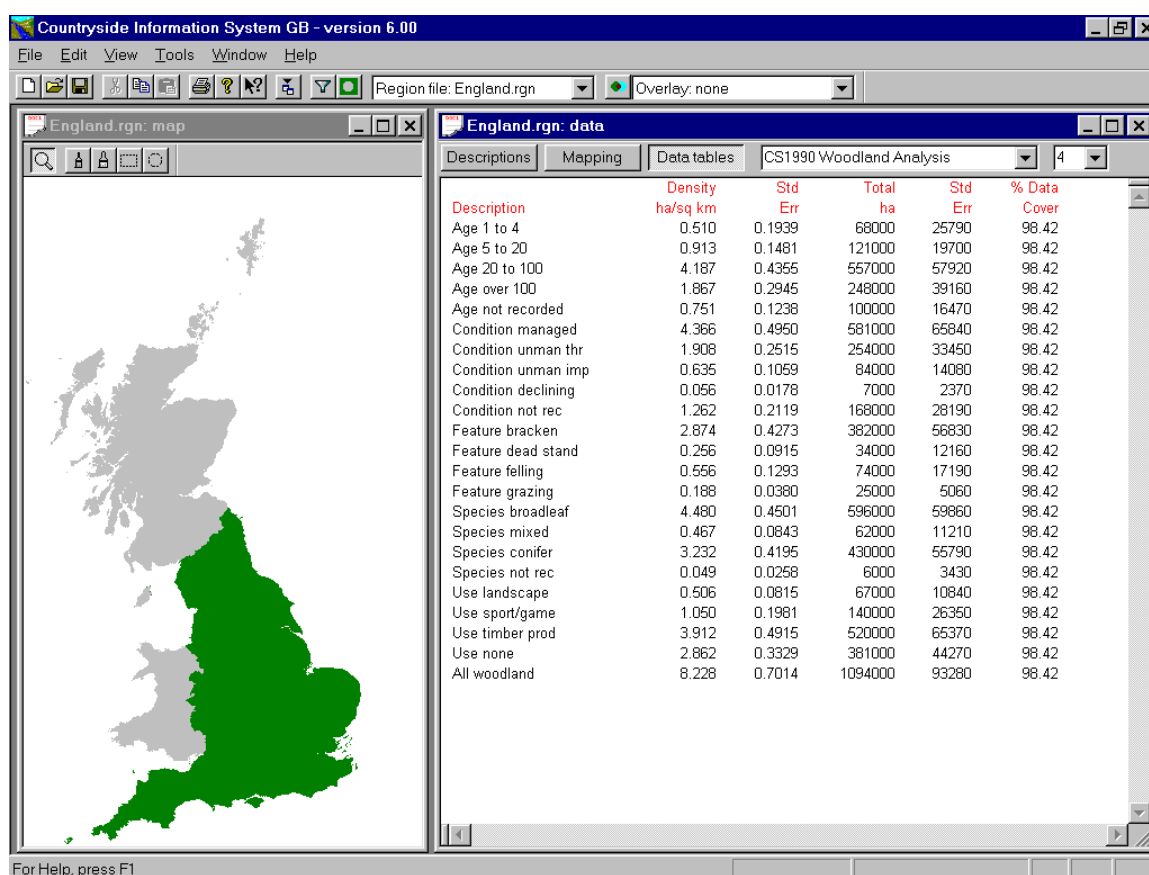


Figure 2. Statistics for age, management conditions additional features, dominant species, and use of woodland in England, as estimated by Countryside Survey 1990 and displayed in CIS.

Conclusion

CIS provides policy makers with a tool to explore and compare data from different sources, which were previously difficult to obtain. This is a significant advance in providing information on which to base informed policy decisions. However, with this accessibility to a range of different sources, understanding the reasons for the differences between them and interpreting what the data mean becomes an important issue for effective use of the information.

Differences between data sources may relate to more than simple “accuracy” and temporal, spatial and methodological have been discussed. One method for comparing the results of different surveys was developed as part of a comparison of land cover definitions project by ITE. Output from this project forms an integral part of the supplementary reference information in CIS, linking corresponding categories between seventeen major national or regional land cover classifications. CIS provides information about data sources, both as on-screen information such as error terms, and as metadata supplied by data providers. Other CIS facilities, such as the overlay map described, enable users to explore differences between data sources.

Further Reading

Stark, G., Barr, C. and Watkins, J. (1997). *Using the Countryside Information System to inform woodland policy*. *Arboricultural Journal*, 21, pp127-126.