

attempt to understand why areas differ in their species composition. The approach has been used in an analysis of floristic changes between 1965 and 1990 in the semi-natural grassland over a 3000 km² area of central England around Sheffield. Worked examples for four sites are included on the poster to show how FIBS analyses are actually carried out.

Modelling stream chemistry in response to afforestation/deforestation

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A model of the combined long-term effects of acidic deposition and forest growth has been developed. The model indicates that afforestation can increase the strong mineral acidity of streams in areas receiving high levels of acidic oxides from the atmosphere. Deforestation promotes a rapid decrease in acidity, although the soil base saturation recovers slowly.

Modelling the impact on water quality of land use change in an agricultural catchment

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An export coefficient model was applied to the 350 km Windrush catchment, a tributary of the upper Thames, in order to predict nutrient and sediment loads, with particular reference to nitrate. A land use survey was used to calibrate the model, and the results of a three-year field work programme, together with archival material provided by the National Rivers Authority, were used for validation. The model was then used to predict water quality for a range of possible changes in land use; these included the changes in farming practice outlined within the new Nitrate Sensitive Area scheme. The approach allows identification of export zones and evaluation of strategies for control of pollution from agricultural land.

Environmental assessment – landscape impacts of land use change

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Macauley Land Use Research Institute

Objective protocols for assessing impacts of land use change on landscape are presented. Scales of assessment range from Scottish national to observer-based scene analysis using digital terrain and land cover data. Orthogonal measures of terrain variation over a local area are combined with observer-based censuses of land visibility to target the assessment of impact on tourists. Changes in land cover provide a basis for retrospective impact assessment for the district of Badenoch and Strathspey in Scotland.

Macauley Land Use Information and Modelling System

C Osman

Macauley Land Use Research Institute

Baseline environmental, biological, and land resource information for Scotland, often collected through detailed field survey, is integrated with planning and other administrative designations, as well as a wide range of socio-economic data from census returns and survey, into a comprehensive information system structured around a geographical information system and relational data base. The information has application to land use issues from local, through regional, to national and international scales, and may be applied to a wide variety of land use questions. The Macauley Land Use Information and Modelling System provides a highly flexible capability and is currently used for resource management and assessment, scientific research, and land use planning.

A geographical information system (GIS) for Dorset heaths

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Records in the form of maps of the distribution and extent of heathland in Dorset dating back to last century have been brought together in a GIS, using a modern base map. The rate and extent of fragmentation are clearly evident from the map series; the severe reduction in viability of the characteristic ecological communities in the scattered remnant areas points to the need for restoration as well as protection. The results of ecological survey over the last 25 years are being incorporated into a GIS to help identify which of those areas recently lost to heathland are likely to respond best to restoration, and give the best chance of success in terms of extending heathland viability.

Modelling lowland farms and farm forestry decision-making

K J Thomson & J F Atkins

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This paper will outline the farm modelling work being carried out in the Department of Agriculture as part of the Joint Agriculture and Environment Programme. The modelling approach used to assess farm forestry options and the criteria used to evaluate various land use scenarios will also be presented.

Socio-economics

Environmental accounts for the primary land use sector

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Prevalent measures of aggregate welfare, such as Gross National Product, do not accurately reflect the standard of living in an economy because they do not