

Supplement 2 BWS2025 RESEARCH METHOD

The Survey

An online survey was opened to participants for a period of eight weeks during July and August 2025. People were invited to participate in a structured online survey, built in LimeSurvey, an open-source survey tool (www.limesurvey.org), Cloud Version 6.15.10. Survey invitations were promoted via news bulletins of land and forestry membership organisations, government agencies, Sylva Foundation’s myForest service, and social media. The survey was presented in English and Cymraeg, the latter provided by in-built AI translation. The survey was designed to operate on desktop computers as well as mobile devices such as phones and tablets. It was hosted online by Sylva Foundation at

www.sylva.org.uk/bws.

The survey consisted of 123 questions in 13 groups, organised within sections of relevance to four distinct types of respondent: Woodland owners (including tenants and other land managers); Agents; forest-related Businesses; and Professionals with an academic or policy interest in forests. Respondents were routed through the survey according to this categorisation.

The survey comprised a range of question types: multiple choice, single-choice array, Likert scale, ranking, numerical input, and free-text comment. Very few questions were mandatory. The benefit to those taking part in the survey is that it improves the experience – feedback from previous surveys spoke of some frustration in being required to answer all questions, whether of interest or not to the respondent – and reduces the time taken to complete the survey. However, this clearly has some implications for analysis: numbers responding to each question vary slightly throughout the survey, as do the number responding to options within a question. In the following results section, the number of respondents is shown in

brackets (n=) to clarify this point, sometimes shown as a range (n≅) where different numbers responded to options within a question. Where data from two questions are compared (for example, exploring differences between respondents in different countries), data on location had to be provided in addition to data in the question under consideration, and the number of responses available for analysis is therefore slightly lower than the total number who answered each question. Limitations are explained in Box S1 (next page).

Free-text responses were thematically grouped using artificial intelligence (AI; ChatGPT-5, OpenAI, 2025). Verbatim responses were provided, and the AI tool suggested clusters of similar comments, which were then refined. Crucially, the prompts given to the AI were informed by reflections on the dataset and by insights drawn from earlier published BWS reports. This ensured that the thematic structure was anchored in existing knowledge while making use of the AI’s capacity to detect recurring patterns across a large number of responses. The process was interactive: AI generated draft categories, which were reviewed with reference to prior evidence, and further prompts were used to refine or subdivide themes. The resulting thematic groupings therefore combined automated pattern recognition with researcher expertise and judgement, producing structured tables of themes and sub-themes that could be reported quantitatively. While this approach enabled a structured and transparent organisation of diverse responses, it is not without limitations. The themes reflect both the automated clustering generated by the AI and researcher judgement, which shaped the prompts and guided the refinement of categories. In particular, the prompts were informed by prior reflections and evidence from earlier BWS reports, meaning that the AI’s role was supportive rather than independent. As a result, the groupings cannot be regarded as fully objective or reproducible in the way that strictly

coded manual content analysis might be. Instead, the process should be seen as a hybrid method that leverages the efficiency of AI pattern recognition while depending on researcher expertise to ensure validity, clarity, and alignment with the aims of the survey.

Abbreviations and Acronyms

AI	artificial intelligence
ha	hectare (equivalent to 2.47 acres)
BWS	British Woodlands Survey
UKFS	United Kingdom Forestry Standard

Statistical notation:

M	mean
Mdn	median
N	sample size
P	p-value (statistical significance)
<	less than
>	greater than
≅	approximately equal to

Statistical Analysis

The main variables against which many responses were explored further were: aims for management; woodland location, woodland size, and respondent type (especially Owner and Agent).

We used descriptive statistics to detail responses, reporting counts, percentages and median values for the response categories of ordinal and categorical variables. Barplots have been used to describe these categorical and ordinal variables, and boxplots to compare the distributions across variables. Linear regression models were used to assess the effects of different factors on respondents’ attitudes.

Longitudinal analyses were performed in R version 4.4.2 (R Core Team, 2024). Data visualisations were created using ggplot2 (Wickham, 2016), and models were built using lme4

BOX S1: LIMITATIONS OF THE SURVEY

In conducting this type of survey research, there are a number of considerations to take into account when interpreting the findings.

The main considerations are:

1. The data reflects the views only of those who participated in the survey. We recognise that there are always those who do not or cannot engage.
2. The survey was only available to those willing to respond online.
3. We recognise the possibility of respondent-bias, particularly for those questions that attempted to ascertain economic costs, and biases related to interpretation of the framing of a question, such as complexities over timescales and other variable factors.
4. Although the survey took on average 32 minutes to complete (Mdn 22 minutes), many respondents spent considerably longer on it. As with all surveys with non-mandatory questions, there was some evidence of survey attrition (lower response rates towards the end of the survey). Randomising questions, one of the best ways of reducing attrition, was not possible because of the complex routing devised to offer different questions to different types of respondent, although randomisation was used wherever possible within individual questions with multiple answers. However, attrition was lower than in some previous surveys, with 72% of the starting number of respondents still providing input at the last question which was available to all respondents (*i.e.* not subject to reduced participation owing to routing).
5. The results analysed are those received from respondents; with minor exceptions where there were obvious discrepancies, no attempt was made to verify data reported.
6. As with any AI-assisted analysis, thematic groupings of qualitative responses reflect both automated pattern recognition and researcher input. The AI's role was supportive rather than determinative; final categories were guided by evidence from previous BWS reports.

for generalised linear mixed models (Bates et al. 2015) or the built-in 'glm' function for generalised linear models.

Model diagnostics were carried out using the DHARMA package (Hartig, 2024). Significance of fixed effects was determined using likelihood ratio Chi-squared tests via the drop1 function. Model coefficient tables were created using sjPlot (Lüdtke, 2024) and post-hoc analyses were conducted using the emmeans package (Lenth, 2024). Some respondents took part in the British Woodlands Survey in multiple years: 18% of respondents for the 2020 survey had taken part in the survey in 2015. In 2025, 24% of respondents had taken the survey at least once before. As these proportions are relatively low, it was not possible to formally account for returning respondents in statistical models. As a result, all models assume that respondents to the 2015, 2020 and 2025 surveys are independent and this represents a limitation of the analysis. Model structures and sample sizes varied by question, and more details are provided in the relevant sections below.

We explored whether woodland size predicted the tendency to have a management plan, for woodland owners and tenants in England in 2025. Woodland area (ha) was skewed across the sample, with many respondents with small woodlands and some respondents with very large woodlands. As a result, woodland size was categorised for modelling (0-10ha, 10-20ha, 20-50ha, more than 50ha). A small proportion of owners were uncertain whether they had a management plan: while owners of small woodlands were more likely to be uncertain than owners of larger woodlands, the model was restricted to only those answering Yes or No due to small sample sizes for the Uncertain category. Presence of a management plan (yes/no) was included in a binomial GLM with a logit link, with woodland size category as a fixed effect. The model comprised data from 185 owners and tenants who specified their woodland size. The relationship between UKFS-compliance and woodland size could not be formally analysed due to sparse data in some categories.

For observations of environmental change, a binomial model with a logit link investigated how observations varied between surveys, and whether Agents differed in their responses compared to Woodland Owners. To account for the fact that respondents provided multiple answers to the question (one for each environmental factor), respondent ID was included as a random effect. All two-way interactions were significant, suggesting that observations vary across years and between woodland owners and agents, depending on the environmental factor in question factor x survey year: LRT=321.81, df = 14, p<0.001; factor x woodland role: LRT=60.25, df = 7, p<0.001; survey year x woodland role: LRT=15.63, df=2, p<0.001).

Analyses of New Ecological Paradigm (NEP) data were conducted by converting a respondent's NEP Likert scores to numeric values (1 to 5) and a M calculated. Data from Agents and Owners were combined, and not analysed separately. Welch t-tests were performed to test if subsets of answers to specific questions exhibited significantly different NEP scores. Welch t-tests were chosen as they are more reliable for samples of differing sample sizes or sample variances. When t-testing a subset, the subgroup was tested against the overall group that did not include the subset to ensure that the assumption of independence was satisfied for the t-test. Tests involving subgroups of insufficient size (n<20) were omitted. For all tests a significance value of p<0.05 was chosen.

Finally, to meet the requirements of the sponsor, further exploration of key questions of interest among Land Managers in England-only are explored in *Supplement 3 BWS2025 England Report*. 'Footnotes' in this report refer to any additional analyses in that supplement in the form of **England Supplement [number]**.

For references, see main report.