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Review of best practice silviculture guidance for the uplands in England



Research Report

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Andy J. Moffat and Andrew Leslie

Forest Research: Farnham

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Enquiries relating to this research should be addressed to:

Dr Andrew Leslie
Forest Research
Northern Research Station
Roslin
Midlothian EH25 9SY
+44 (0)782 688 3133
andrew.leslie@forestresearch.gov.uk

Forest Research

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1. Introduction

This report is a review of forestry guidance for upland silviculture in England. It was sought by Forestry England to inform foresters, and others working in the sector, how to access modern upland forestry best practice. This is now of especial concern in the context of building resilience into forests in the face of modern threats such as climate change and invasive pests and diseases. In particular, the review was expected to identify important elements of best practice guidance, summarise their relevance for upland silviculture, and signpost where to find them, preferably from online, freely available sources. It was acknowledged that while some types of best practice guidance are relatively conspicuous on websites that are well-known to the sector, other forms are relatively hidden (e.g. in amorphous websites such as www.gov.uk). Still others may be relevant but have been archived or are located on websites belonging to professional societies (e.g. Royal Forestry Society of England and Wales, Royal Forestry Society of Scotland). Some, such as the Forestry Commission Operational Guidance Booklet (OGB) series, are no longer routinely accessible, though the OGB series is archived and potentially available for revision. Some published peer-reviewed papers may qualify as best practice guidance but are hard to access.

1.1 Upland forestry policy

Current Forestry Commission policy for forestry in England is contained in 'Thriving for the Future: Forestry Commission Strategy 2023–'28'. At present, this is being reviewed to understand its impact, celebrate what is working, and identify areas for improvement.

Box 1 Statements in the Forestry Commission strategy relevant to understanding forestry policy for upland silviculture

- 'by 2028 [...] 34 000 ha of new tree cover [per annum] to be on track to the Environment Act target of at least 16.5% tree cover in England by 2050' (p. 12)
- 'new trees and woodland to help improve connectivity of habitats and ecosystems which have become fragmented' (p. 13)
- 'new planting should be based on evidence of the choice of species that will be most productive, resilient to climate change and pests and diseases' (p. 13)
- 'bring more of our woodlands into active management' (p. 15)
- 'more woodland owners are seeking certification that they are managing to the highest standards of sustainability' (p. 15)
- 'assist in growing the forestry sector and timber resource while also improving biodiversity, sequestering carbon, moderating temperatures, reducing pollution and decreasing flood risk' (p. 17)
- 'help to mature private investment into woodlands, including markets in carbon, water and biodiversity' (p. 26)
- 'help to make forestry an innovative sector that can take new methods and technologies to scale' (p. 28).

Upland forestry is not mentioned specifically in the strategy, but it is clear that many of the policy aspirations are central to it (Box 1), and that the ultimate success of the strategy is dependent on the maintenance and enhancement of forest areas as well as silvicultural management in upland (and lowland) England. Unsurprisingly, the strategy makes clear that forestry will need to face the hazards posed by issues such as climate change and invasive pests and diseases. However, it also identifies the prospects for moving towards more sustainable and resilient forestry by confronting these challenges and embracing opportunities brought by new practices and technologies.

Table 1 The area of upland and lowland forests in England and Great Britain.

Forest type	Area below 300 m (ha)	Area above 300 m (ha)
England		
Broadleaved	794 943	6 395
Conifer	227 830	21 058
Mixed, mainly broadleaved	24 977	360
Mixed, mainly conifer	28 368	362
Total area	**1 076 119**	**28 175**
Great Britain		
Broadleaved	1 098 859	21 992
Conifer	658 428	202 048
Mixed, mainly broadleaved	49 224	1 750
Mixed, mainly conifer	47 565	1 977
Total area	**1 854 077**	**227 766**

1.2 Extent of upland forest in England

There is no agreed definition of where upland forests are located in England. Natural England (2018) suggests that upland habitats have traditionally been considered as those above the 250 m contour, and 'above the moorland wall' (p. 1).

However, their report acknowledges that the:

> altitudinal element is approximate as in some areas, open moorland can be found at slightly lower elevations but nonetheless, these areas are regarded as being upland in character, reflecting the habitats and species found within them and often their continuity with blocks of higher land. (p. 1)

A 250 m contour was not available on OS GIS layers, so a 300 m contour has been used to generate the data shown in Figure 1 for England. Table 1 gives estimates of the area of different types of upland forest in England and Great Britain. The outputs should be considered as a 'snapshot' of upland forestry in 2025. The area of upland forest in England is currently comparatively small, but is complemented by significant areas in Scotland and Wales.

Figure 1 Location of upland forests in England (National Forest Inventory data).



1.3 Future risks for upland forestry in England

The UK Climate Change Risk Assessment 2021 (CCRA3) represents the most recent formal analysis of risk induced by climate change. UK Climate Risk have published a summary of the main findings for England, as well as a section relating to land-use, land-use change and forestry. Though the land use section does not distinguish between lowland and upland forests, it still contains information that is relevant to the latter (Box 2).

Box 2 Statements from 'Land use, land-use change and forestry' (UK Climate Risk, 2021) relevant to upland forests

- 'forestry could also be impacted both positively and negatively by a changing climate and through an increase in the number of extreme weather events' (p. 2)
- 'risks to and opportunities for forestry productivity from extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind)' (p. 3)
- 'UK forests could be at risk from an increase in pests, pathogens, and invasive, non-native species that may increase in numbers due to climate change, especially milder winters' (p. 2)
- 'there may also be opportunities for the productivity of forests because of climate change, as it may make the UK suitable for new tree species' (p. 2).

Further information on risks to forests and forestry posed by climate change can be found in the Climate Change Hub, a dedicated section of the Forest Research website.

More widely, likely pressures, old and new, to the nature and direction of forestry in Britain over the next 50 years have been recently reviewed by a group of forestry experts (Tew *et al.*, 2023). Again, no distinction was made in this review regarding particular pressures pertinent to upland forestry, but much of the information is relevant (Box 3).

Box 3 Insights from 'A horizon scan of issues affecting UK forest management within 50 years' (Tew *et al.*, 2023) relevant to upland forests

- 'natural disturbance to European forests, particularly caused by wind, fire, and bark beetles' (p. 353)
- decrease in timber productivity; an increasing proportion of harvesting efforts as salvage and phytosanitary logging; greater fluctuations in timber markets
- increase in the seasonality of rainfall patterns and the severity of both flooding and drought events
- wetter winters, making winter operations such as thinning and harvesting more challenging and, in some cases, impossible
- more attention to management practices that enhance soil functioning (e.g. different ground preparation approaches), or planting soil-improving tree species
- the development of standards and trading models to value, register, and market a greater range of forest ecosystem services, following the precedent set by the Woodland Carbon Code
- 'Smart silviculture' including 'managing growth and form within mixed species, uneven-aged stands [...] and selective product felling to meet specific and time-bound market demand' (p. 356)
- 'increased demand for a diversity of wood products' with consequent need for 'changes in silviculture and species diversification and an increase in harvesting and planting to provide supply' (p. 356)
- reduction in forest productivity due to adherence to legal requirements and environmental standards.

1.4 What is best practice guidance?

Table 2 offers a working definition and some core principles which help to identify what best practice guidance is, and what doesn't qualify. This review is based on the premise that best practice guidance:

- should be published or endorsed by the Forestry Commission or its research agency, Forest Research, or;
- should represent practices and methodologies built on sound scientific principles but also proven to deliver expected outputs and outcomes in the field and forest, and;
- should not be built on short-term research which is not corroborated by other studies or experience. If imported from overseas forestry experience, it should have been tested under UK upland forestry conditions or have undergone appropriate scientific interpretation and risk analysis.

However, best practice guidance primarily represents what has worked in the past and is expected to work in the present. Inevitably, it becomes out of date and requires revision to keep abreast of the changing forestry legal and policy environment as well as developments in research and technology, such as Artificial Intelligence. In addition, not all existing guidance has yet been 'future-proofed' by appropriate foresight and scientific analysis or modelling using climate and other projections. There is an ongoing process for the review of Forest Research publications. Future proofing is also beginning to take place, and in some areas (e.g. ESC and ForestGales), is very active. In this report the fitness for future purpose of best practice guidance will be assessed where appropriate.

Table 2 Definition and core principles for best practice guidance in forestry.

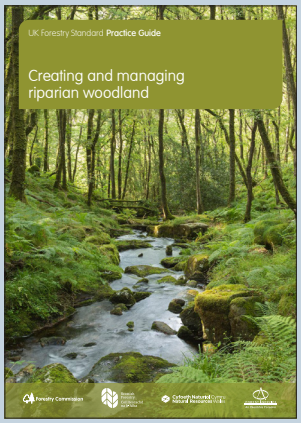
Definition	
Best practice guidance refers to a set of principles, recommendations, and operational approaches that support responsible and sustainable forest management. It translates scientific understanding, ethical considerations, and practical experience into actionable advice for those managing or interacting with forested landscapes.	
Core Principles	
Sustainability	Encourages long-term ecological, social, and economic viability of forest systems.
Evidence-informed decision-making	Draws on current research, monitoring, and practitioner experience to guide actions.
Context sensitivity	Recognises the diversity of forest types, local conditions, and management goals, promoting adaptable approaches.
Risk reduction	Aims to minimise negative impacts such as soil degradation, biodiversity loss, or vulnerability to pests and climate extremes.
Transparency and accountability	Promotes clear documentation, stakeholder engagement, and ethical practice.
Continuous improvement	Supports learning, innovation, and the refinement of techniques over time.

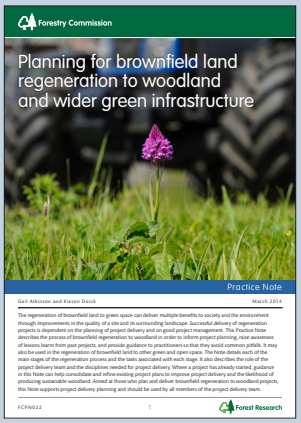
2. Government best practice guidance for upland silviculture

Best practice guidance published by the Forestry Commission, Forest Research, and the other devolved UK forestry departments is built on a hierarchical model, headed by the UK Forestry Standard (UKFS) and supported by a range of other publication series (Figure 2a–b). Such guidance is also contained in other Forestry Commission and Forest Research publications, such as Forestry Commission Bulletins, Information Notes, Operational Guidance Booklets, and Operations Notes.

This section of the report will examine these hierarchical levels in turn in order to evaluate their value for upland silviculture and identify publications of particular relevance. Additional sources of best practice guidance will be introduced at appropriate places in this section where it makes sense to do so.

Figure 2a Core forestry practice series of UKFS technical publications.





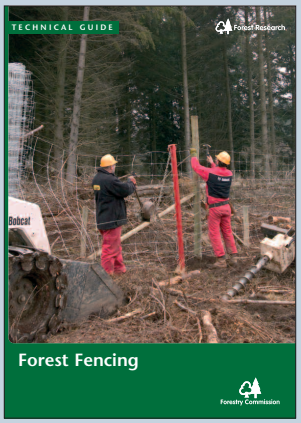
Practice Guide
Audience: Forest managers, practitioners, and planners

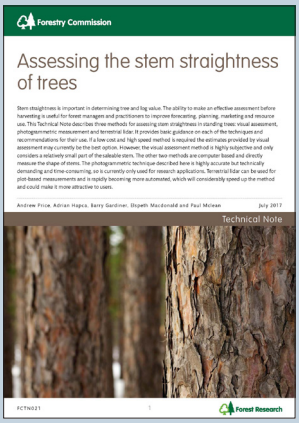
Scope: UK/GB/country-level guidance expanding on the principles of sustainable forest management outlined in the UKFS, to provide detailed 'how to' advice.

Practice Note
Audience: Forest managers, practitioners, and planners

Scope: UK/GB/country-level guidance expanding on the principles of sustainable forest management outlined in the UKFS, to provide detailed 'how to' advice.

Figure 2b Core forestry operations series of Forest Research technical publications.





Technical Guide
Audience: Forest managers, operational staff, and machine operators

Scope: GB-level operational and technical guidance.

Technical Note
Audience: Forest managers, operational staff, and machine operators

Scope: GB-level operational and technical guidance.

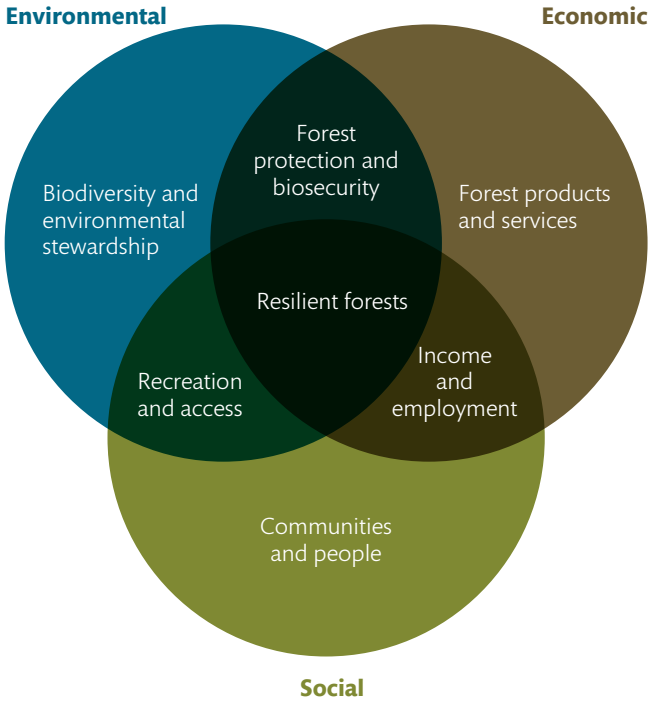
2.1 The UKFS

The UK Forestry Standard (UKFS) is the technical standard for forestry across the UK, and provides the foundation for sustainable forest management (SFM). First published in 1998, the UKFS is based on sustainable forest management criteria agreed internationally, implemented in a way that is appropriate to the UK. The optimal model for SFM is expressed as a Venn diagram (Figure 3), where 'resilient forests' are seen as the ultimate objective (placed at the centre of the diagram), and are achieved by appropriately balancing economic, environmental, and social objectives. With the contents subject to significant peer review and signed off by all four devolved forestry departments, the UKFS could be regarded as the starting point to explore forestry best practice, including that for upland silviculture. The UKFS aims to provide concise information on requirements necessary to practice sustainable forestry, and its guidance generally provides a high-level overview. Requirements and Guidelines for SFM are described in eight complementary sections:

- General Forestry Practice
- Forests and Biodiversity
- Forests and Climate Change
- Forests and Historic Environment
- Forests and Landscape
- Forests and People
- Forests and Soil
- Forests and Water.

The current (5th) edition of the UKFS was published in 2023 and came into force in 2024. It can therefore be regarded as comparatively up to date, while acknowledging that the forestry 'environment' is constantly changing and that technical and scientific knowledge is always developing. With the inclusion of a formal section on *Forests and Climate Change*, it can also be regarded as forward looking and aware of climate-induced hazards that may increase in magnitude over the next decades. The division between lowland and upland forestry is not emphasised in the UKFS ('upland' is only mentioned 11 times throughout), but the standards and guidance are based on the experience gained across the afforestation programme that began in earnest when the Forestry Commission was formed in the early part of the twentieth century. So the vast majority of the guidance in it will be worthy of consideration and application in the context of upland silviculture. The UKFS is easy to obtain but understanding can also be gained through targeted online learning using the Silvestor online platform.

Figure 3 UKFS balanced objectives. Source: The UK Forestry Standard (2023).



2.2 Sources of best practice guidance supporting the UKFS

As noted in the Introduction, forestry guidance has been published across a range of sources and types of media.

2.2.1 Forestry Commission

As of 2018, all Forestry Commission standards and guidance are published on www.gov.uk. Many reports relevant to upland silviculture have been published on this all-embracing website, but to locate and access most of them it is necessary to either know the title of the report, or to use the search engine provided. To explore the effectiveness of this for identifying relevant material, the key words 'upland' and 'silviculture' were used: over 1200 records were revealed, the vast majority having little or no relevance to the topic under study. Appendix 1 is the result of using expert judgement to select publications of likely relevance. However, failure to locate other publications with known relevance was also noted, suggesting that diligent users wishing to find useful material need to be experimental in their approach. Without knowledge that such material exists, this can be extremely time-consuming, and is likely to be very ineffective.

Appendix 1 shows that some areas of silviculture are covered in some detail, while others are not. In addition, there appears to be no clear distinction between material published on www.gov.uk and that published on the Forest Research website on behalf of the Forestry Commission and other forestry administrations. Such unclear signposting can only be to the detriment of effective communication about particular subjects such as upland silviculture.

2.2.2 UKFS supporting publications curated by Forest Research

Forest Research is now responsible for managing and enabling access to the range of publications that support the UKFS, as illustrated in Figure 2 (a–b). For the most part, these publications have been written by Forest Research staff. They include Practice Guides, Practice Notes, Technical Guides, and Technical Notes. Appendices 2, 3 and 4 contain lists of those that have been published since each series was commissioned. An assessment of those likely to be of relevance to upland silviculture in England has been included in each list, though this is only an indication, and other publications may be of value from time to time. Conversely, the content and guidance in some of the older publications may have been superseded, and care should be applied when drawing from them. It is understood that several are currently identified for revision. All the publications are available to be downloaded free of charge from the Forest Research website. However, it is regrettable that the search engine on this site is currently very ineffective and in dire need of improvement.

Examination of the four lists identifies that, in many cases, publications arose out of individual circumstances – there is little evidence of a strategic approach to good/best practice provision. As a result, there is inevitable overlap and confusion of purpose between the different series. In addition, there are some conspicuous gaps in provision of best practice guidance, especially in the context of the new pressures that upland silviculture faces.

2.2.3 Forestry Commission Bulletins and other series

In addition to the UKFS supporting publications reviewed in Section 2.2.2, Forest Research has produced a wide range of written outputs, mainly published by the Forestry Commission or HMSO/ The Stationery Office (though as of 2018 these outputs are published by Forest Research). These include Booklets, Bulletins, Information Notes, Field Books, Field Guides, Handbooks, Research Notes, and Research Reports (Appendices 5 and 6). All series contain potentially valuable information and silvicultural guidance, though it would take a significant period of time to review this.

Of the publication series listed above, Forestry Commission Bulletins formed the most prestigious publication series, and the one which contained scientific and technical publications to disseminate research findings and practical advice on forestry to a wide audience. Dating from 1919 until 2010 (Appendix 5), they contain considerable information relevant to upland silviculture, although it is likely that, in many cases, more modern Forest Research best practice guidance makes reference to this as appropriate. No attempt has been made in this review to assess their value, as the vast majority of Bulletins

are from the last century, and many are unavailable online. However, many of the more recent Bulletins have been digitised and are available for downloading free of charge from the Forest Research website.

A further extensive series of publications are the Information Notes (Appendix 6), many of which have been replaced by more current publications, but the series also contains some that remain relevant, such as Information Notes 40 and 45 relating to transformation of stands to continuous cover forestry (CCF).

Forest Research has committed to investigating publishing the complete list of its publications catalogue on its website, which will assist those who wish to explore historical reports for their value today.

2.2.4 Forestry Commission Operational Guidance Booklets (OGBs) and Policy, Practice and Guidance notes (PPGs)

OBGs were a series of internal guides intended for Forestry Commission use only, and were mainly designed for those planning, supervising, or carrying out forest operations in the public forest estate. They were intended to be updated regularly to maintain relevance to modern legal, policy, and technical developments. Table 3 identifies those considered of most relevance to upland silviculture best practice. The series is available in hard copy format from the Forestry Commission Library at Alice Holt Research Station, where a digital archive is also kept. However, the most recent of these was published ten years ago and only one, OGB15 has been kept up to date. With this exception, it is considered that OGBs have been superseded by more recent publications and publication series, notably Forestry England's Policy, Practice, and Guidance notes (PPGs), available online to Forestry Commission staff on the Forestry England Roots Intranet (Appendix 7).

2.2.5 Forestry Commission Silvicultural Guides

Two useful documents were published under the short-lived Silvicultural Guide series, both of which have relevant information to upland silviculture and are described in Table 4.

2.2.6 Forest Research Technical Development Branch publications

The Technical Development Branch (TDB) in Forest Research carried out research on operational methods, techniques, and machinery, evaluating performance in terms of the quality of the work, environmental protection, economics of the operation, and health and safety. During its existence, the TDB, and its predecessor the Work Study Branch, produced many written reports (Table 5). However, like the OGB series, most were designed for consumption within the forestry sector, and none were made available via the Forest Research website. Today, they can be retrieved retrieved by Forest Research staff via the Forest Research intranet. At the time of publication, many TDB reports were directly relevant to upland silviculture, focusing especially on machinery and methods used, or of potential use, in site preparation, planting, and harvesting. However, the most recent TDB report is now 20 years old, and many predate this by several decades.

2.2.7 Decision support tools

Best practice guidance is primarily delivered via the written word, usually as books or reports (available in hardcopy and/or online). However, a range of Forest Research and other digital decision support tools (DSTs) are available, which are founded on sound science and considerable research, field experience and operational expertise, and consumer feedback. As such, they epitomise best practice guidance. Some of those most relevant to upland silviculture are briefly described below – further information on Forest Research DSTs can be found on the Forest Research website.

Table 3 Forestry Commission OGBs with relevance to upland silviculture best practice in England (presumed most recent version).

OGB	Date	Version	Title
OGB4	2013	Version 3	Plant density: surveys and monitoring
OGB7	2010	Version 3.1	Managing Continuous Cover Forests
OGB9	2010	Version 2.0	Thinning
OGB15	2025	Version 3.4	Chemicals in the Forest
OGB17	2015	Version 3.4	Planning for the unexpected
OGB17a	2014	Version 1.0	Contingency Planning Framework
OGB17b	2014	Version 1.0	Managing incidents in the Forestry Commission
OGB29	2015	Version 1.3	Handling plants for successful planting
OGB32	2008	Version 1.1	Production Forecasting
OGB36	2007	Version 1	Forest Design Planning

Table 4 Forestry Commission Silvicultural Guides with relevance to upland silviculture best practice in England (presumed most recent version).

Series	Date	Version	Title
Silvicultural Guide	2011	Version 1.0	Thinning Practice
Silvicultural Guide	2016	Version 1.0	Successful Underplanting

Table 5 TDB Reports accessible in the Forest Research digital archive.

Dates	Type	No. of items
1985 to 1999	Information Notes	106
1992 to 2005	Internal Project Information Notes	239
1976 to 2000	Output Guides	22
1991 to 1999	TDB Reports	91
1992 to 2005	Technical Notes	189
1989 to 1991	Work Study Branch Reports	69

Ecological Site Classification (ESC) is a web-based decision support system published and supported by Forest Research. It aims to help forest managers and planners select tree species that are ecologically suited to particular sites, instead of selecting a species and trying to modify the site to suit. ESC is designed to match key site factors with the ecological requirements of different tree species and woodland communities. It provides a user-friendly way of working out options for tree species and native woodland communities on individual sites. The user is required to input two pieces of site information: (1) grid reference and (2) soil type.

More precise estimates of soil quality and suitability of tree species and woodland communities can be obtained by inputting more detailed site information on soil attributes and plant indicator species. A guide to indicator species is available from the Royal Forestry Society (RFS).

Guidance videos were produced by Forest Research but are out of date and are not currently available online.

ESC assesses the suitability of a range of tree species and National Vegetation Classification (NVC) woodland communities. The evaluation is based on the match between key site factors, the ecological requirements of different species, and the ecology of woodland communities defined in the NVC.

ESC 5 incorporates future climate change projections for 2061–2080 for Representative Concentration Pathways (RCP) 4.5 and 8.5 to enable users to examine the impacts of future tree species suitability under an intermediate and extreme emissions scenario.

Forest Development Types (FDTs), which are now included in ESC results, are a long-term vision of how the species composition and structure of a forest stand is intended to develop. The concept encourages greater use of mixed species stands and a wider variety of stand structures. It also promotes better use of site adapted species and natural regeneration. Management tools have been developed which will help practitioners to use FDTs to diversify their forests and increase resilience.

The benefits of FDTs include:

- provision of a comprehensive view of the potential species, mixtures, and stand structures for a site
- provision of a framework and common language for managers helping them to describe different forest structures
- challenging current silvicultural practice
- aiding long-term planning and management of resilient forests, helping consecutive managers work towards a long-term goal
- promoting the trend towards mixed stands and diverse forest structures
- facilitating multi-purpose forest management as economic, environmental, and social objectives are all embedded.

FDTs can be used by policymakers, planners, and forest managers aiming to increase the diversity of their forests.

Access to FDT predictions for a site is via ESC, after completion of its requirements for site and soil information.

The **FDT concept** is described by:

- a guide, which explains how the FDT concept works and how it should be applied in different circumstances
- a series of flashcards – each FDT has a double-sided information sheet (flashcard) describing the composition, structure, climatic requirements, and management options.

Climate matching tool (CMT) (Version 1.4), originally developed by Forest Research, uses three climatic variables to match the user selected future climate projection of a location to the best fitting current climate (analogue climate). This is done using decadal or 30-year normal periods of monthly mean precipitation, average temperature, and diurnal temperature range from the UKCP18 12 km resolution data for Europe.

CMT gives forestry practitioners an accessible method to demonstrate what the projected climate of a site will be like in the future by suggesting similar analogue areas in the current climate. This could affect species choice and management systems and could help practitioners begin to plan adaptation responses in forest management. The CMT also works in reverse, taking the climate data of an area where a forest pest occurs now, and seeing the extent and range of best-fit climates in the future (i.e. where the pest may thrive in the future).

ForestGALES is a computer-based decision support system and hybrid-mechanistic model that assesses the risk of wind damage to forests, allowing users to compare the potential impacts of different silvicultural practices. Forest Research currently supports three versions of ForestGALES, operating at different spatial scales: at the stand level (ForestGALES Desktop 2.5 and ForestGALES 3.0/fgr), at site level (ForestGALES Online 2.5), and for individual trees within a stand (ForestGALES 3.0/fgr). Because of the effects of topographic complexity and the inherently unpredictable nature of windstorms and the risk of wind damage, for practical applications ForestGALES is recommended for use at forest scales, rather than for individual stands.

ForestGALES operates within a standard risk framework whereby risk is defined as the interplay between the vulnerability of a system and the hazard it is exposed to. Risk is therefore calculated in two stages. Firstly, the **vulnerability** of trees to wind damage is computed as the critical wind speed at which trees will be damaged, either by uprooting or stem breakage. Secondly, the localised wind climate is derived to represent the wind **hazard**. Multiple methods exist to characterise wind climates.

Traditionally and most commonly, this is done with a Weibull distribution of mean wind speeds in a specific location. In British forestry, the DAMS (Detailed Aspect Method of Scoring) windiness score was developed to provide an accessible interpretation of the Weibull distribution of wind speeds. **Risk** is then defined as the probability of exceeding the calculated critical wind speeds given the localised wind climate. The return periods of damaging storms based on stand location can then be calculated from this probability.

ForestGALES calculates the **vulnerability** to wind damage using information from the trees (i.e. species, height, stem diameter, age – to estimate height and diameter when not known directly) and the site (i.e. soil type, rooting depth, spacing between trees, thinning, type of forest edge).

Forest Yield is a PC-based yield model for forest management in Britain, developed by Forest Research. The software provides the user with estimates of various aspects of tree growth for a range of tree species, yield classes, and management prescriptions. The software and user manual are supported by a handbook on forest growth and yield tables for those who would like to know more about the theory underpinning yield modelling. Forest Yield is designed to be of use to forest and woodland managers and practitioners, among others.

There are plans in the pipeline to update Forest Yield and make it more accessible.

myForest is an online support tool, developed by the Sylva Foundation, which brings the latest information technology to the forestry sector. It is aimed at owners of small forests, community forest groups, environmental charities, and forest management companies. myForest provides comprehensive online mapping, digital tools, and the latest resources not only to sustainably manage forests, but to provide unique support for the creation of new forests around Britain. myForest is a flagship project for the Sylva Foundation. Its mission is to use forestry knowledge and information technology skills, supported by state-of-the-art evidence, to provide innovative solutions to some of the greatest environmental challenges facing modern society.

All the Forest Research DSTs described above are under continual and substantial development, particularly to make them more user-friendly. Those interested in learning more about them are advised to contact the relevant team via their dedicated email address.

2.2.8 Spreadsheet-based tools

In addition to online decision support systems there are several spreadsheet-based tools available online that are relevant to resilient upland forests (Table 6).

Table 6 Spreadsheet-based tools produced by Forest Research and available online.

Tool	Function
Robust mixtures tool	A spreadsheet that uses growth rates and shade tolerance to generate a compatibility score for two species mixtures. This can be refined by using an estimate of top height at age 20. High compatibility allows use of an intimate mixture, whereas low compatibility requires use of blocky or line mixtures. An article describing the tool is available on the Royal Forestry Society website.
Thinning prescription for irregular stands spreadsheet, based on Forestry Commission Information Note 45	This spreadsheet provides thinning guidance to conform to a user defined stand diameter class distribution and target basal area. The spreadsheet requires input of stand data, and a diameter class distribution is then generated. This is compared to the ideal distribution, which highlights numbers and sizes of trees that need thinning.
Deer management model	This spreadsheet and a user manual are available by email (contact Robin Gill: robin.gill@forestresearch.gov.uk). It requires an estimate of current deer numbers and uses a model for red deer that estimates appropriate cull numbers.

2.2.9 Best practice guidance videos

Both the Forestry Commission and Forest Research have dedicated channels on YouTube with uploaded videos of value to the forestry sector. Many fit the description of best practice guidance. The Forestry Commission's channel contains 194 videos, and Forest Research's channel currently contains 47.

2.3 Devolved forestry departments

Forestry England has produced an internal Policy, Procedure, and Guidance series that is designed to assist employees to conform to legislation, policy, and also best practice. Two that are particularly relevant to resilience are Contingency Planning and Forest Plans.

Apart from England, other forestry departments publish on their own websites. Those for Northern Ireland (DAERA), Wales (Natural Resources Wales – NRW), and Scotland (Scottish Forestry) were examined for any material relevant to English upland silvicultural interest. Table 7 contains those considered to have some relevance. Those from Scottish Forestry seem particularly pertinent.

Table 7 Recent best practice guidance relevant to upland silviculture issued by devolved forestry services in Scotland and Wales.

Body	Title	Date
NRW	How we are implementing the Practice Guide '*Managing Forests in Acid Sensitive Water Catchments*' in Wales	2017
NRW	Improving the structural diversity of Welsh woodlands	2017
NRW	Improving the tree species diversity of Welsh woodlands	2017
NRW	Managing the genetic diversity of Welsh woodlands	2017
Scottish Forestry	A Routemap to Resilience for Scotland's Forests and Woodlands	2025
Scottish Forestry	Scottish Windblow Contingency Plan	2024

3. UK forestry third sector organisation guidance

The review explored reports and other publications produced by professional and trade bodies representing the forestry sector in Britain to identify possible guidance on upland silviculture that should be included as best practice guidance. Websites managed by the Confederation of Forest Industries (Confor), the Royal Forestry Society (RFS), the Royal Scottish Forestry Society, the Scottish Forestry Trust (SFT), and the Institute of Chartered Foresters were visited. In general, there was a lack of information that might qualify as good upland silvicultural guidance from these organisations, but Table 8 identifies online downloadable publications considered of interest to the sector. The 2022 RFS publication 'Resources for managing woodland for resilience' seems particularly useful as it collates a range of important weblinks, many of which will be of relevance for upland silviculture.

There are also useful sources of information produced by organisations focused on a specific type of silvicultural practice. For example, the Continuous Cover Forestry Group website has an extensive archive of webinars and documents.

Table 8 Recent best practice guidance relevant to upland silviculture issued by forestry professional bodies.

Body	Title	Date
Confor	Guidance on responsibilities for environmental protection in forestry	2018
Confor	Biodiversity, forestry and wood	2020
Confor	The role of productive woodlands in water management	2014/2025
RFS	Resources for managing woodland for resilience	2022
SFT	The potential for use of rotational mixtures with Sitka spruce in British upland forests	2014

4. UK Woodland Assurance Standard

Based on the UKFS, the UK Woodland Assurance Standard (UKWAS) is an independent certification standard for verifying sustainable woodland management in the UK that is used for both Forest Stewardship Council® (FSC®) and the Programme for the Endorsement of Forest Certification (PEFC) certification. Like the UKFS,, UKWAS is under a process of continual revision, with the most recent edition (version 5) published in 2024. UKWAS 5 has generated some useful guidance to support application and adherence to the UKFS, some of which could be used as best practice guidance inasmuch as they clearly define what silvicultural (and other) practices are required to comply with the UKFS. These include the UKWAS 5 basic requirements booklet, and the UKWAS 5 appendix reference document, which contains reference to the main legislation, regulations, guidelines, and codes of practice referred to in UKWAS 5. Appendix 8 describes the chapter and section headings in the basic requirements publication – almost all are relevant for upland silviculture.

5. Ongoing research and journal articles

The most recent research has not yet been published as guidance but is regularly published as articles in forestry journals. It is estimated that there were about 180 scientific journals devoted to forestry across the world in 2008 (Vanclay, 2008), and it is likely that this has increased in the intervening years. In the UK, there are two principal journals which have a rigorous peer review process, namely *Forestry* and the *Arboricultural Journal*. The stated policy of the former is to publish 'high quality articles and reviews on all aspects of research, practice, and policy that inform and promote the sustainable management of forests and trees'. Two others, *Quarterly Journal of Forestry* and *Scottish Forestry*, contain some articles subject to peer review, but others which aren't reviewed as rigorously.

With the exception of *Arboricultural Journal*, which has a focus on urban forestry, all these journals contain material which either offers good practice guidance, the scientific underpinning behind existing or evolving forestry practice, or both. Given the need for such publications to provide novel and stimulating material, it is arguable that the lack of significant field testing (e.g. across a range of site types and silvicultural systems) that many articles suffer from means that their content cannot be equated with best practice guidance without due care. Nevertheless, there are good recent examples of guidance being drawn from systematic study of a range of previous studies or experimental campaigns that could reasonably justify best practice guidance status. As an example, Tables 9a, 9b, and 9c contain a list of recent papers from the three main forestry journals discussed above that provide some potentially useful upland silvicultural guidance. It might be expected that, in time, such guidance will be further tested and, if appropriate, contribute to the development of established silvicultural thinking, guidance, and practice.

Scientific publication has changed over recent years and continues to do so. The two tables identify that many scientific papers are now 'open access', meaning that they are free to read and download. However, it remains true that other important papers may only be available to subscribers of the journal, or to members of the professional body. This can prevent widespread uptake of emerging good practice.

The challenge of monitoring a large amount of potentially relevant material from forestry journals beyond the UK is considered a significant task, and one beyond most silviculturists. This issue is discussed further in Section 7.

Table 9a *Forestry* journal papers (2020–2025) with content relevant to upland silviculture best practice guidance (**OA** = open access).

Date	Title
2025	Seventeen coniferous tree species show early promise for future commercial timber production in the UK. **OA**
2025	Sprucing up the UK's Sitka spruce (*Picea sitchensis*) forests: can tree species diversification benefit biodiversity?
2023	Acetamiprid used to prevent *Hylobius abietis* damaging young trees poses a very low risk of causing water contamination provided good forestry practices are followed.
2023	An analysis of conifer experiments in Britain to identify productive alternatives to Sitka spruce. **OA**
2022	Continuous cover forestry in Europe: usage and the knowledge gaps and challenges to wider adoption. **OA**
2021	Underplanting is a practical silvicultural method for regenerating and diversifying conifer stands in Britain.
2020	Are there viable chemical and non-chemical alternatives to the use of conventional insecticides for the protection of young trees from damage by the large pine weevil *Hylobius abietis* L. in UK forestry?
2019	Direct seeding of birch, rowan and alder can be a viable technique for the restoration of upland native woodland in the UK.
2018	Nursing mixtures can enhance long-term productivity of Sitka spruce (*Picea sitchensis* (Bong.) Carr.) stands on nutrient-poor soils.
2014	Suitability of close-to-nature silviculture for adapting temperate European forests to climate change. **OA**
2014	Early weed control can increase long-term growth, yield and carbon sequestration of Sitka spruce stands in Britain.

Table 9b Other peer-reviewed journal papers (2020–2025) with content relevant to upland silviculture best practice guidance (**OA** = open access).

Date	Title
2024	A comparison of the early growth and survival of lesser-known tree species for climate change adaptation in Britain. *Forest Ecol & Management*
2024	Increasing resistance and resilience of forests, a case study of Great Britain. *iForest*. **OA**
2023	Non-hazardous rapeseed oil spray adjuvants do not improve the rainfastness or effectiveness of glyphosate for *Rhododendron ponticum* shrub control. *New Forests*
2022	Intimate mixtures of Scots pine and Sitka spruce do not increase resilience to spring drought. *Forest Ecology and Management*. **OA**
2021	Proportions of a pine nurse influences overyielding in planted spruce forests of Atlantic Europe. *Forest Ecology and Management*. **OA**
2021	Acetamiprid, chlorantraniliprole, and in some situations the physical barriers MultiPro® or Kvaae® wax, can be alternatives to traditional synthetic pyrethroid insecticides for the protection of young conifers from damage by the large pine weevil *Hylobius abietis* L. *Scandinavian Journal of Forest Research*. **OA**

Table 9c Recent *Scottish Forestry* and *Quarterly Journal of Forestry (QJF)* papers with content relevant to upland silviculture.

Date	Title
2025	Mixed species broadleaved and broadleaved/conifer stands in Great Britain for timber production. *QJF*.
2023	Do mixtures improve the productivity and quality of Sitka spruce stands in the uplands? *Scottish Forestry*.
2022	The potential of the selective graminicides cycloxydim and propyzamide as habitat improvement tools for the pearl-bordered fritillary butterfly. *QJF*.
2022	The role of nursing mixtures in upland Britain. *Scottish Forestry*.
2022	What needs to change for managers to diversify tree species to improve pest and disease resilience within the UK's production forests? *QJF*.
2022	How resilient are planted UK forests to drought? A summary of recent research on Sitka spruce and Scots pine. *QJF*.
2021	Can direct seeding be used to enhance the restoration of native species to conifer plantations on ancient woodland sites? *Scottish Forestry*.
2020	Establishing robust species mixtures. *QJF*.
2020	Cultivation of soils for forestry. *QJF*.

6. Essential best practice guidance

Following review, guidance considered to be most up to date and relevant to forest resilience is presented in this section.

6.1 General resilience guidance

Forest Research Climate Change hub – for broad and general information on forest resilience, as well as Decision Support Tools and publications.

UKFS Practice Guide: Adapting forest and woodland management to the changing climate – for a good overview of adaptation measures for building resilient forests.

6.2 Site appraisal and planning

Forestry Commission Field Guide: The identification of forest soils for forest management (2012)

Forestry Commission Practice Guide: Managing forest operations to protect the water environment (2019)

Environment Agency Technical Report: Forestry Operations - A Review of Best Practice Guidance for the Protection of the Freshwater Environment (1999)

Forestry Commission guidance: A guide to planning new woodland in England (2021)

Forestry Commission guidance: Landscape and woodland design for woodland creation (2023).

6.3 Site selection

Forest Research resource: ESC webpage (including access to FDTs) and online tool and Quick Guide

Forest Research Tree Species Database

Natural Resources Wales (NRW) Good Practice Guide: Forest Resilience Guide 2: Improving the tree species diversity of Welsh woodlands (2017) – a useful guide on alternative conifers related to site type.

Forest Research resource: a series of reports on provenance – a useful source of information on emerging species.

Also see recent journal articles listed in Section 5.

6.4 Establishment – general

Forest Research Forest Development Types and, as useful background, the FDT Diversification Guide

Forestry Commission Bulletin: Silvicultural principles for upland restocking (1988)

Forestry Commission Bulletin: The potential for natural regeneration of conifers in Britain (1999)

Forestry Commission silvicultural guide: Successful Underplanting (2016)

Forestry Commission Operations Note: Guidance on cultivation and UKFS compliance for application in England (2021)

Scottish Forestry guidance: Cultivation of upland productive woodland creation sites (2021)

Forest Research internal Operational Guidance Book: Using pesticides in the forest (2025)

Forestry Commission Bulletin: Forest fertilisation in Britain (1991)

Forest Research report: The integrated management of *Hylobius abietis* in UK forestry (2022)

Forestry Commission Practice Guide: Reducing pesticide use in forestry (2004).

6.5 Establishment – Mixed species stands

Quarterly Journal of Forestry technical paper: Establishing robust species mixtures and associated spreadsheet (2020)

Scottish Forestry journal article: Alternative models for productive upland forestry Model 2: Sitka spruce mixtures with alternative conifers (2015)

Forestry Commission Information Note: Managing mixed stands of conifers and broadleaves in upland forests in Britain (2006)

Forestry Commission Bulletin: Creating new native woodlands (1994)

Scottish Forestry journal article: The role of nursing mixtures in upland forestry in Britain (2022).

6.6 Tending

Forestry Commission guide: Thinning practice: a silvicultural guide (2011)

Forestry Commission Field Guide: Thinning Control (2015)

Forestry Commission Practice Note: Respacing naturally regenerating Sitka spruce and other conifers (2010)

Webpage to access ForestGales.

Forestry Commission Practice Guide: Managing and controlling invasive rhododendron (2006).

6.7 CCF

Forest Research Silvicultural Guidance: Transforming and managing stands under continuous cover forestry (2026)

Forestry Commission Information Note: Transforming even-aged conifer stands to continuous cover management (2004)

Forestry Commission Information Note: Monitoring the transformation of even-aged stands to continuous cover management (2002).

7. Discussion and conclusions

7.1 Upland site selection and acquisition for forestry

This review has identified that the UKFS and supporting guidance cover the main 'building blocks' of upland silviculture, including planning, establishment, and protection; silvicultural systems; and harvesting, although some of the material needs updating. However, in the context of woodland creation based on Right Tree, Right Place principles, site selection and acquisition are poorly served. What guidance exists is posted on the www.gov.uk website (Appendix 1), but this does not look at the issue from a financial opportunity perspective, instead mainly dealing with inevitable constraints on where woodland creation is possible and how grant aid can be given if numerous requirements are met. Currently, it is the private sector, notably specialist investment advisers such as Gresham House, that is providing such advice, though whether this is in strict accordance with UKFS sustainable forestry principles has not been evaluated. Friends of the Earth, too, offer help in site selection at a local and regional scale. It is appreciated that tools like the Forestry Commission Map Browser with Land Information Search and Defra's MAGIC DST exist to help in site selection. However, there is an opportunity for the Forestry Commission to consider this area afresh with a view to publishing authoritative guidance; it might help to encourage more woodland creation in years to come.

7.2 The importance of site appraisal

The Right Tree, Right Place concept is fit for purpose when considering the need to build resilience into new and existing woods and forests. However, its brevity, advantageous as it is for communicating the concept within the forestry sector, hides the importance of effective site appraisal. With significant and future changes to the climate in upland England, there is now a strong need for silviculturists to understand drainage and flood risk, soil types, properties and likely behaviour throughout the crop rotation, and windthrow hazard, in order to mitigate and reduce risks to acceptable levels. Site appraisal is not just a prelude for choosing appropriate tree species, but it should also build an understanding of site and soil characteristics which will remain relevant throughout the life of the tree crop (e.g. is the site at risk of soil erosion before canopy closure and again after harvesting?). Site appraisal should also take into account possible impacts from, and to, the land around the site itself, especially from water ingress into the site from uphill, and how the site is likely to affect surface watercourses downstream. Such considerations should also take into account extreme weather conditions under future climates, not just those predicted for current or modal years in the future. Site appraisal may be considered a somewhat specialist set of tasks, but sustainable upland silviculture depends upon it, and silviculturists should seek to understand the basics of site characterisation and behaviour, and team up with specialist site surveyors as necessary. Site appraisal could, of itself, form a valuable addition to the UKFS Practice Guide series.

7.3 The importance of contingency planning

The UKFS makes 16 references to contingency and identifies 'contingency planning' as one of three elements of forest planning, to sit alongside the 'forest management plan' and the 'operational (or site) plan'. Up to 2019, the Forestry Commission supported this requirement within its public forest estate management by publishing three internal Operational Guidance Booklets: 'Planning for the unexpected', the 'Contingency Planning Framework', and 'Managing incidents in the Forestry Commission' (OGB17, 17a, 17b; Table 3). OGBs 17a and 17b are now contained within the PPG17 Contingency Planning page on the Forestry England intranet (Roots), but are not available to the wider forestry sector. This is surely a significant deficiency, given the modern understanding of risks posed by climate, pests and diseases, and other vectors.

An exception to the position described above is the 2024 Scottish Forestry report on contingency planning in the event of major windblow events. Similar reports should be produced to prepare the sector for the probability of other extreme events, as outlined in Section 1.3, and published as UKFS Practice Notes or as a UKFS Practice Guide.

7.4 Forestry science – how to keep on top of the challenge

This review of best practice guidance has focused on what information already exists and has attempted to provide a logical structure for its appraisal and where to find it. However, forestry takes place within a dynamic political, environmental, social, economic, and technical setting. Hence, what might constitute best practice guidance will change over time, as new knowledge and experience are accrued against this backdrop. In addition, outputs from forest science have risen very significantly in parallel with worldwide interest in the subject – a recent study suggests an increase from 820 articles in 2010 to 2354 in 2021. It is important to consider how, in future, developments in silvicultural science from overseas might be relevant to foresters in England and the UK. At present there is no formal system of review, but an expectation exists that forest scientists will take the opportunity to track relevant material in order to support their particular research interests. This is in contrast to previous (analogue) times when an 'Assistance with reading' service was offered to Forest Research staff, and others on request, by the library staff at Alice Holt Research Station. Paper-based summaries of likely interesting or relevant papers and articles were highlighted. This review suggests that its replacement with a digital system might be of value. It could be based on setting up alerts on relevant forestry journal websites, open access repositories such as core.ac.uk, and on Google Scholar, with outputs collated, summarised, and reported in Zotero. Much of this can now be automated, though a new system would benefit from implementation and subsequent management by someone trained in information communication.

7.5 How to optimise guidance to the forestry sector

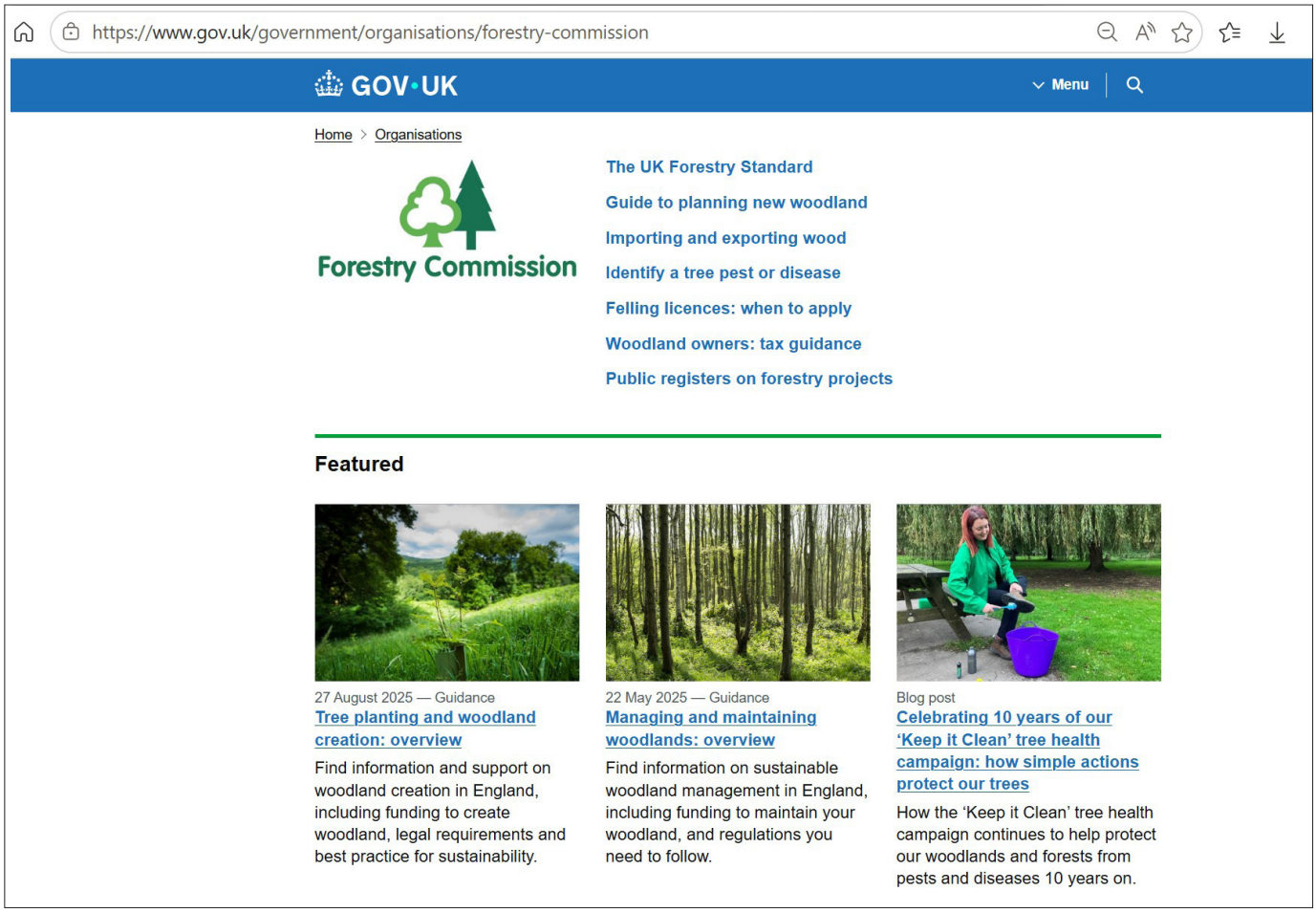
Since forestry devolution was completed in 2019, there has been no Great Britain-wide system for the publication of forestry reports and guidance for the sector. The previous classification and structuring of Forestry Commission publication types, which had a category specifically devoted to practice guidance (Figure 2a), looks to have significantly broken down. Individual countries in Great Britain now manage their own systems, while Forest Research alone adheres to the previous structure to some extent. However, the dominance of external research funding for Forest Research also means that much of its work is now reported in external contract reports, outside of the publication classification system. Fragmentation of relevant guidance has resulted, leading to a risk of failure to communicate key best practice guidance messages. The weaknesses of the Forest Research website have already been referred to.

Similar arguments can be made with respect to the www.gov.uk vehicle for forestry information dissemination. The website search engine is an incredibly blunt instrument; for example, simply entering 'forestry' into it yields 6225 results. Similarly, entering the term 'upland silviculture' yields 1211 results. There is no simple means to explore these and determine which are relevant.

It seems naïve to expect the forestry sector to understand this position or to have the time and resources to combat it without support from state forestry services. This review suggests that further consideration should be given to how best practice guidance can be better signposted on the Forest Research website. A similar approach to the creation of its 'Climate Change Hub' area might be one approach worth exploring. With respect to the www.gov.uk website, it is worth considering if the current landing page (Figure 4) could highlight silvicultural guidance more clearly. It would then be helpful if users could be directed to a catalogue of useful material (with more effective use of linking tools). However, it is anticipated that there may be obstacles or constraints to this approach.

A more fundamental issue is the best media and channels to deliver guidance on different topics to the wide range of stakeholders now involved in forest management, each with different levels of knowledge and interest in aspects of forest resilience. Currently most guidance is in a pdf written report format, but many other options are available, such as video, scenario-based exercises, decision support tools, field demonstrations, and structured online and/or face-to-face courses.

Figure 4 Current landing page for the Forestry Commission area of www.gov.uk.



7.6 Conclusions

This rapid but relatively deep dive into best practice guidance for upland silviculture to build resilience into future forests has identified a wealth of relevant and well-founded information. However, such information is spread across a wide range of sources, and there is little advice available on where interested parties should go in order to obtain the best available guidance. In several cases, guidance is hard to find on individual websites. This report summarises the information that is available, identifies gaps that might be filled, and makes suggestions for how the forestry sector might be better informed in the future.

Appendices

Appendix 1: Publications on www.gov.uk relevant to upland silviculture

Title	Date	Hyperlink
Create a woodland management plan	07/2025	https://www.gov.uk/guidance/create-a-woodland-management-plan
Guidance: forestry EIA application form: afforestation	07/2025	https://www.gov.uk/government/publications/eia-afforestation-application-form/guidance-forestry-eia-application-form-afforestation
A guide to agroforestry	06/2025	https://www.gov.uk/guidance/a-guide-to-agroforestry
Forestry Commission Operations Notes (England)	06/2025	https://www.gov.uk/government/collections/forestry-commission-operations-notes-england
Tree felling licence: when you need to apply	06/2025	https://www.gov.uk/guidance/tree-felling-licence-when-you-need-to-apply
Edge design for woodland integration, resilience and biodiversity	04/2025	https://www.gov.uk/guidance/edge-design-for-woodland-integration-resilience-and-biodiversity
Forestry project checks: constraints	02/2025	https://www.gov.uk/guidance/forestry-project-checks-constraints
Planning new woodland - Section 1: Introduction	01/2025	https://www.gov.uk/government/publications/a-guide-to-planning-new-woodland-in-england/planning-new-woodland-section-1-introduction
Planning new woodland - Section 2: Preparing to plan (scoping and survey)	01/2025	https://www.gov.uk/government/publications/a-guide-to-planning-new-woodland-in-england/planning-new-woodland-section-2-preparing-to-plan-scoping-and-survey
Planning new woodland - Section 3: Developing your woodland creation plan	01/2025	https://www.gov.uk/government/publications/a-guide-to-planning-new-woodland-in-england/planning-new-woodland-section-3-developing-your-woodland-creation-plan
How to benefit species and habitats biodiversity in your woodland	11/2024	https://www.gov.uk/guidance/how-to-benefit-species-and-habitats-biodiversity-in-your-woodland
Tree felling: overview	08/2024	https://www.gov.uk/guidance/tree-felling-overview
The benefits of woodland creation: Woods and Carbon	07/2024	https://www.gov.uk/government/publications/the-benefits-of-woodland-creation-woods-and-carbon/the-benefits-of-woodland-creation-woods-and-carbon
Guidance to help inform when an upland breeding wader survey is needed and when woodland creation is likely to be appropriate	04/2024	https://www.gov.uk/government/publications/guidance-for-afforestation-proposed-on-or-near-nationally-important-upland-breeding-wader-areas
A guide to Forestry Commission's sensitivity maps for woodland creation	02/2024	https://www.gov.uk/guidance/a-guide-to-forestry-commissions-sensitivity-maps-for-woodland-creation
The benefits of continuous cover forestry	12/2023	https://www.gov.uk/government/publications/the-benefits-of-continuous-cover-forestry/the-benefits-of-continuous-cover-forestry
Improve infrastructure for managing woodlands	08/2021	https://www.gov.uk/guidance/improve-infrastructure-for-managing-woodlands
Replace trees after felling due to pests and diseases	08/2021	https://www.gov.uk/guidance/replace-trees-after-felling-due-to-pests-and-diseases
Woodland creation and mitigating the impacts of deer	12/2020	https://www.gov.uk/government/publications/woodland-creation-and-mitigating-the-impacts-of-deer
Tree protection: The use of tree shelters and guards	06/2020	https://www.gov.uk/government/publications/tree-protection-the-use-of-tree-shelters-and-guards
Use the Forestry Commission map browser and Land Information Search	07/2018	https://www.gov.uk/guidance/use-the-land-information-search

Appendix 2: List of UKFS Practice Guides

Practice guide	Title	Year	Potential relevance to upland silviculture ✓ ×
FCPG001	Lowland acid beech and oak woods	1994	×
FCPG002	Lowland beech – ash woods	1994	×
FCPG003	Lowland mixed broadleaved woods	1994	×
FCPG004	Upland mixed ashwoods	1994	×
FCPG005	Upland oakwoods	1994	✓
FCPG006	Upland birchwoods	1994	✓
FCPG007	Native pinewoods	1994	×
FCPG008	Wet woodlands	1994	✓
FCPG009	Forest operations and badger setts	1995	×
FCPG010	Involving communities in forestry	1996	×
FCPG011	Whole-tree harvesting – a guide to good practice	1997	✓
FCPG012	Design techniques for forest management planning	2014	✓
FCPG013	Hazards from trees – a general guide	2000	×
FCPG014	Restoration of ancient woodland on ancient woodland sites	2003	✓
FCPG015	Reducing pesticide use in forestry	2004	✓
FCPG016	Creating new broadleaved woodland by direct seeding	2004	✓
FCPG017	Managing and controlling invasive rhododendron	2006	✓
FCPG018	Raising trees and shrubs from seed	2007	×
FCPG019	Greenspace design for health and well-being	2012	×
FCPG020	Managing deadwood in forests and woodlands	2012	✓
FCPG021	Choosing stand management methods for restoring planted ancient woodland sites	2013	×
FCPG022	Building wildfire resilience into forest management planning	2014	✓
FCPG023	Managing forests in acid sensitive water catchments	2014	✓
FCPG024	Manging open habitats in upland forests	2015	✓
FCPG025b	Managing forest operations to protect the water environment	2025	✓
FCPG025c	Managing forest operations to protect the water environment – Cab Cards	2025	✓
FCGP026	Adapting forest and woodland management to the changing climate	2023	✓
FCGP027	Designing and managing forests and woodlands to reduce flood risk	2022	✓
FCPG028	Creating and managing riparian woodland	2024	✓
FCPG101	Identifying the historic environment in Scotland's forests and woodlands	2010	×
FCPG102	Conserving and managing trees and woodlands in Scotland's designed landscapes	2012	×
FCPG103	Achieving diversity in Scotland's forest landscapes	2012	×
FCPG104	Deciding future management options for afforested deep peatland	2015	✓

Appendix 3: List of UKFS Practice Notes

Practice note	Title	Year	Potential relevance to upland silviculture ✓ ×
FCPN001	Nearest neighbour method for quantifying wildlife damage to trees in woodland	1998	×
FCPN002	The prevention of rabbit damage to trees in woodland	1998	✓
FCPN003	The prevention of mammal damage to trees in woodland	1998	✓
FCPN004	Controlling grey squirrel damage to woodlands	1998	✓
FCPN005	Red squirrel conservation	2001	✓
FCPN006	Managing deer in the countryside	1999	✓
FCPN007	Establishment of short rotation coppice	1999	×
FCPN008	Using local stock for planting native trees and shrubs	1999	✓
FCPN009	Recommendations for fallow, roe and muntjac deer fencing: new proposals for temporary and reusable fencing	1999	✓
FCPN010	Nant-yr-hwch long-term forest design plan: an example of good practice from the private sector	2000	×
FCPN011	Practical techniques for surveying and monitoring squirrels	2001	×
FCPN012	Handling and storing acorns & chestnuts and sycamore fruits	2002	×
FCPN013	Managing brash on conifer clearfell sites	2006	✓
FCPN014	Managing the pine weevil on lowland pine	2007	×
FCPN015	Managing acute oak decline	2010	×
FCPN016	Respacing naturally regenerating Sitka spruce and other conifers	2011	✓
FCPN017	Minimising the impact of the great spruce bark beetle	2012	✓
FCPN018	Chosing Sitka spruce planning stock	2012	✓
FCPN019	Managing public safety on harvesting sites	2013	✓
FCPN020	Monitoring the oak processionary moth with pheromone traps	2013	×
FCPN021	Establishing and managing geneconservation units	2014	×
FCPN022	Planning for brownfield land regeneration to woodland and wider green infrastructure	2014	×
FCPN101	Managing forests for white-tailed eagles	2011	✓
FCPN102	Managing forests as red squirrel strongholds	2012	✓
FCPN103	Expanding woodlands in special protection areas for golden eagles	2015	✓
FCPN104	Managing woodland access and forest operations in Scotland	2013	×

Appendix 4: List of UKFS Technical Guides and Notes

Technical guide	Title	Year	Potential relevance to upland silviculture ✓ ×
FCTG001	Winching operations in forestry: tree takedown and vehicle debogging	2004	✓
FCTG002	Forest fencing	2006	✓
Technical note	**Title**	**Year**	**Potential relevance to upland silviculture ✓ ×**
FCTN001	Harvesting machine census 1999 & 2001	2002	×
FCTN002	Planning controlled burning operations in forestry	2002	×
FCTN003	Forest and moorland fire suppression	2002	✓
FCTN004	Burning forest residues	2002	✓
FCTN005	Chainsaw debutressing of standing timber	2003	✓
FCTN006	Respiratory protective equipment	2003	✓
FCTN007	Noise hazards in forestry operations and selection of personal protective equipment	2003	✓
FCTN008	Excavator mound spacing on restocking sites	2004	✓
FCTN009	Small-scale systems for harvesting woodfuel products	2005	✓
FCTN010	Extraction route trials on sensitive sites	2004	✓
FCTN011	Protecting the environment during mechanised harvesting operations	2005	✓
FCTN012	Mechanised spraying systems for herbicide use in forestry	2006	✓
FCTN013	Traction aids in forestry	2006	✓
FCTN014	Planning and managing pesticide stores	2006	✓
FCTN015	Selecting nozzles for hand-held applicators	2006	✓
FCTN016	Using dye markers to reduce pesticide use	2007	✓
FCTN017	Cleaning mechanised pesticide spray equipment	2007	✓
FCTN018	Using acoustic tools in forestry and the wood supply chain	2009	✓
FCTN019	Fence marking to reduce grouse collisions	2013	✓
FCTN020	Reducing Greenhouse Gas Emissions from forest civil engineering	2013	✓
FCTN021	Assessing the stem straightness of trees	2017	✓
UKFSTN022	Controlling grey squirrels in forests and woodlands in the UK	2019	✓

Appendix 5: List of Forestry Commission Bulletins

Bulletin	Title	Publication year
FCBU001	Collection of data as to the rate and growth of timber	1919
FCBU002	Survey of forest insect conditions in the British Isles	1919
FCBU003	Rate and growth of conifers in the British Isles	1920
FCBU004	The Douglas Fir Chermes (*Chermes cooleyi*.)	1922
FCBU005	Poplars	1923
FCBU006	The Phomopsis disease of conifers	1925
FCBU007	The Silver Fir Chermes	1926
FCBU008	British bark-beetles	1926
FCBU009	Beetles injurious to timber	1928
FCBU010	Growth and yield of conifers in Great Britain	1928
FCBU011	Nursery investigations	1928
FCBU012	Forest gardens	1931
FCBU013	Studies on tree roots	1932
FCBU014	Forestry practice	1933–1986
FCBU015	Scottish moorlands in relation to tree growth	1933
FCBU016	Studies on the pine shoot moth	1936
FCBU017	Cultivation of the cricket bat willow	1936
FCBU018	Spring frosts	1946
FCBU019	Poplars	1952
FCBU020	Studies on British beechwoods	1953
FCBU021	Tree root development on upland heaths	1955
FCBU022	Experiments in tree planting on peat	1954
FCBU023	Mull and mor formation in relation to forest soils	1954
FCBU024	The volume-basal area line – a study in forest mensuration	1955
FCBU025	Studies of North-West American forests in relation to silviculture in Great Britain	1955
FCBU026	Adelges insects of silver firs	1956
FCBU027	Utilisation of hazel coppice	1956
FCBU028	Sitka Spruce in British Columbia	1957
FCBU029	Shelterbelts and microclimate	1957
FCBU030	Exotic forest trees in Great Britain	1957
FCBU031	Code of sample plot procedure	1959
FCBU032	Afforestation of upland heaths	1960
FCBU033	The status and development of elm disease in Britain	1960
FCBU034	Chalk downland afforestation	1962
FCBU035	Pruning conifers for the production of quality timber	1963
FCBU036	Mycorrhizal associations and calluna heathland afforestation	1963
FCBU037	Experiments on nutrition problems in forest nurseries (volumes I and II)	1965
FCBU038	The great spruce bark beetle dendroctonus micans in North-West Europe	1965
FCBU039	Use of land for forestry within the proprietary land unit	1969
FCBU040	Rooting and stability in Sitka Spruce	1967
FCBU041	Forest management, and the harvesting and marketing of wood in Sweden	1967
FCBU042	Conifer woolly aphids (*Adelgidae*) in Britain	1971
FCBU043	Nursery practice	1972
FCBU044	Operational research and the managerial economics of forestry	1971

Bulletin	Title	Publication year
FCBU045	Windblow of Scottish forests in january 1968	1971
FCBU046	Forest of Dean day visitor survey	1973
FCBU047	Work study in forestry	1973
FCBU048	Weeding in the forest	1974
FCBU049	The potential of Western hemlock, Western red cedar, Grand fir and Noble fir in Britain	1974
FCBU050	Fifty years of forestry research	1974
FCBU051	Forest products in the United Kingdom economy	1974
FCBU052	Influence of spacing on crop characteristics and yield	1974
FCBU053	Production and use of tubed seedlings	1975
FCBU054	Seed orchards	1975
FCBU055	Aspects of thinning	1976
FCBU056	Evaluation of the contribution of forestry to economic development	1976
FCBU057	The safety of the herbicides 2,4-D and 2,4,5-T	1977
FCBU058	Conifer lachnids	1982
FCBU059	Seed manual for ornamental trees and shrubs	1982
FCBU060	Research on Dutch elm disease in europe	1983
FCBU061	Technology transfer in forestry	1984
FCBU062	Silviculture of broadleaved woodland	1984
FCBU063	Census of woodlands and trees 1979–82	1987
FCBU064	The yield of sweet chestnut coppice	1987
FCBU065	Advances in practical arboriculture	1987
FCBU066	Choice of seed origins for the main forest species in Britain	1987
FCBU067	Population biology and control of the Pine Beauty Moth	1987
FCBU068	Price-size curves for conifers	1987
FCBU069	Beech bark disease	1987
FCBU070	Air pollution and forestry	1987
FCBU071	The management of red deer in upland forests	1987
FCBU072	Predicting the productivity of Sitka spruce on upland sites in Northern Britain	1987
FCBU073	Rhododendron ponticum as a forest weed	1987
FCBU074	Forest health surveys 1987 – Part 1: Results	1987
FCBU075	The silviculture and yield of wild cherry	1988
FCBU076	Silvicultural principles for upland restocking	1988
FCBU077	British softwoods – properties and uses	1988
FCBU078	Natural regeneration of broadleaves	1988
FCBU079	Forest health surveys 1987 – part 2: analysis and interpretation	1988
FCBU080	Farm woodland planning	1988
FCBU081	Goshawks: their status, requirements and management	1989
FCBU082	A systems approach to forest operations planning and control	1989
FCBU083	Seed manual for forest trees	1992
FCBU084	Taxation of woodlands	1989
FCBU085	Dendroctonus micans in Britain – its biology and control	1989
FCBU086	Forests and surface water acidification	1990
FCBU087	The 1987 storm: impacts and responses	1989
FCBU088	Monitoring of forest condition in the United Kingdom 1988	1989
FCBU089	Nitrogen deficiency in Sitka spruce plantations	1990
FCBU090	Barn owl conservation in forests	1990

Bulletin	Title	Publication year
FCBU091	The timbers of farm woodland trees	1990
FCBU092	Poplars for wood production and amenity	1990
FCBU093	Ash dieback – a survey of non-woodland trees	1991
FCBU094	Monitoring of forest condition in Great Britain 1989	1990
FCBU095	Forest fertilisation in Britain	1991
FCBU096	Sawmilling accuracy for bandsaws cutting British softwoods	1991
FCBU097	Research for practical arboriculture	1991
FCBU098	Monitoring of forest condition in Great Britain 1990	1991
FCBU099	Urban trees	1991
FCBU100	Honey fungus	1991
FCBU101	De-icing salt damage to trees and shrubs	1991
FCBU102	Forest fencing	1992
FCBU103	Super sitka for the 90s	1992
FCBU104	Valuing informal recreation on the Forestry Commission estate	1992
FCBU105	Roe deer biology and management	1994
FCBU106	Woodland management for pheasants	1992
FCBU107	A manual of good practice for the use of sewage sludge in forestry	1992
FCBU108	Monitoring vegetation changes in conservation management of forests	1992
FCBU109	The value of birch in upland forests for wildlife conservation	1993
FCBU110	Reclaiming disturbed land for forestry	1994
FCBU111	Forest nursery practice	1994
FCBU112	Creating new native woodlands	1994
FCBU113	Management of forests for capercaillie in Scotland	1994
FCBU114	Forests and wind: management to minimise damage	1995
FCBU115	Alternative silvicultural systems to clear cutting in Britain: a review	1995
FCBU116	Analysis of the changes in forest condition in Britain 1989–1992	1995
FCBU117	Water storage of timber: experience in Britain	1996
FCBU118	Ecology and conservation of raptors in Forests	1998
FCBU119	Cultivation of soils for forestry	1999
FCBU120	The potential for the natural regeneration of conifers in Britain	1999
FCBU121	Forest Tree seedlings – best practice in supply, treatment and planting	1999
FCBU122	Agro forestry in the UK	2000
FCBU123	Managing rides, roadsides and edge habitats in lowland forests	2000
FCBU124	An ecological site classification for forestry in Great Britain	2001
FCBU125	Climate change: impacts on UK forests	2002
FCBU126	Phytophthora disease of alder in Europe	2003
FCBU127	Choice of Sitka spruce seed origins for use in British forests	2007
FCBU128	Estimating deer abundance in woodlands	2008
FCBU129	Selection of Douglas fir seed sources for use in Britain	2010

Appendix 6: List of Forestry Commission Information Notes

Information note	Title	Publication year	Potential relevance to upland silviculture ✓×
FCIN001	Forestry Practice Publications	1997	✓
FCIN002	Overwinter Physiology & the Practical Implications for Handling of Noble Fir Seedlings	1997	✓
FCIN003	Bracken as a Peat Alternative	1998	✓
FCIN004	Forest Condition 1997	1998	✓
FCIN005	Phytotoxicity of Insecticides used to Control Aphids on Sitka Spruce	1998	✓
FCIN006	Phytophthora Disease of Alder	2000	✓
FCIN007	Poplar Rust and its Recent Impact in Great Britain	2001	✓
FCIN008	The National Inventory of Woodland and Trees	1998	✓
FCIN009	Coniferous Standing Sales Price Index (Great Britain)	1998	✓
FCIN010	Timber Quality: A Pilot Study for Assessing Stem Straightness	1998	✓
FCIN011	Testing Plant Quality	1998	✓
FCIN012	Estimating the Age of Large and Veteran Trees in Britain	1998	✓
FCIN013	The Landscape Value of Farm Woodlands	1998	✓
FCIN014	Overwinter Physiology and Implications for Handling and Time of Planting of Scots and Corsican Pine Bare-Rooted Seedlings	1998	✓
FCIN015	Creating New Native Woodlands: Turning Ideas into Reality	1999	✓
FCIN016	Tranquillity Mapping as an Aid to Forest Planning	1999	✓
FCIN017	Poplar and Willow Varieties for Short Rotation Coppice	1999	×
FCIN018	PG Suspension for the Control of Fomes Root Rot of Pine	1999	✓
FCIN019	Forest Condition 1998	1999	✓
FCIN020	Overwinter Physiology and the Practical Implications for Handling of Bare-Rooted Silver Birch Seedlings	1999	✓
FCIN021	Approved Poplar Varieties	1999	×
FCIN022	Dieback of Pedunculate Oak	1999	✓
FCIN023	Using Natural Colonisation to Create or Expand New Woodlands	1999	✓
FCIN024	Low Technology Kilns and Drying Schedules for Hardwood in Small-scale Operations	1999	✓
FCIN025	Comparsion of Sawlog Quantity and Quality between Sitka Spruce Seedlots Originating from Washington and Queen Charlotte Islands	1999	✓
FCIN026	Predicted Genetic Gains from Sitka Spruce Production Populations	1999	✓
FCIN027	Genetic Gain from Scots Pine: Potential for New Commercial Seed Orchards	1999	✓
FCIN028	Domestic Stock Grazing to Enhance Woodland Biodiversity	1999	✓
FCIN029	What is Continuous Cover Forestry	1999	✓
FCIN030	Phytophthora Pathogens of Trees: Their Rising Profile in Europe	1999	✓
FCIN031	Climate Change - Implications for Forestry in Britain	2000	✓
FCIN032	Plant Communities and Soil Seedbanks in Broadleaved-Conifer Mixtures on Ancient Woodland Sites in Lowland Britain	2000	✓
FCIN033	Forest Condition 1999	2000	✓
FCIN034	An Introduction to New Landscape Ecology Research to Enhance Biodiversity in British Forests	2000	✓
FCIN035	Natural Regeneration in Broadleaved Woodlands: Deer Browsing and the Establishment of Advance Regeneration	2000	✓
FCIN036	The Impact of Deer on Woodland Biodiversity	2000	✓

Information note	Title	Publication year	Potential relevance to upland silviculture ✓×
FCIN037	Environmental Monitoring in British Forests	2000	✓
FCIN038	The Assessment of Site Characteristics as Part of a Management Strategy to Reduce Damage by *Hylobius*	2001	✓
FCIN039	Protocol for Stem Straightness Assessment in Sitka Spruce	2001	✓
FCIN040	Transforming even-aged conifer stands to continuous cover management	2004	✓
FCIN041	Forest condition 2000	2001	✓
FCIN042	Timber cladding in Scotland	2002	×
FCIN043	The supply of homegrown timber products to the building industry in Scotland	2002	✓
FCIN044	The opportunities for woodland on contaminated land	2002	×
FCIN045	Monitoring the transformation of even-aged stands to continuous cover management	2002	✓
FCIN046	Forest condition 2001	2002	✓
FCIN047	Nutrition of Sitka spruce on upland restock sites in northern Britain	2002	✓
FCIN048	Forests, carbon and climate change: the UK contribution	2003	✓
FCIN049	Red band needle blight of pine	2003	✓
FCIN050	Growing juniper: propagation and establishment practices	2003	✓
FCIN051	Forest condition 2002	2003	✓
FCIN052	Breeding hybrid larch in Britain	2003	✓
FCIN053	Recent changes to the control of forest reproductive material	2003	✓
FCIN054	Predicting site suitability for natural colonisation: upland birchwoods and native pinewoods in northern Scotland	2004	✓
FCIN055	An indication of the likely volume gains from improved Sitka spruce planting stock	2004	✓
FCIN056	Restoration of neglected hazel coppice	2004	✓
FCIN057	Conservation of black poplar (*Populus nigra* L.)	2004	×
FCIN058	The products of conifer tree breeding in Britain	2004	✓
FCIN059	Advances in biotechnology: powerful tools for tree breeding and genetic conservation	2004	✓
FCIN060	International markets in wood products	2004	✓
FCIN061	Managing the threat to restocking posed by the large pine weevil, *Hylobius abietis*: the importance of time of felling of spruce stands	2004	✓
FCIN062	Forest condition 2003	2004	✓
FCIN063	Managing light to enable natural regeneration in British conifer forests	2004	✓
FCIN064	'Proving it!' Evidence gathering for forest managers	2005	✓
FCIN065	Water use by trees	2005	✓
FCIN066	Development of Multiple Leaders in Sitka Spruce and Japanese Larch Following Outplanting	2005	✓
FCIN067	Needle diseases of pine	2005	✓
FCIN068	Shoot diseases of pine	2005	✓
FCIN069	Climate change and British woodland	2005	✓
FCIN070	Utilisation of Lodgepole Pine	2005	✓
FCIN071	Golden Eagles and New Native Woodland in Scotland	2005	✓
FCIN072	Birch Dieback in Scotland	2005	✓
FCIN073	Evaluating Biodiversity in Fragmented Landscapes: Principles	2005	✓
FCIN074	Woodland Owners' Attitudes to Public Access Provision in South-East England	2005	✓
FCIN075	Forest Condition 2004	2005	✓

Information note	Title	Publication year	Potential relevance to upland silviculture ✓×
FCIN076	Habitat use by red and grey squirrels: results of two recent studies and implications for management	2005	✓
FCIN077	Selecting the right provenance of oak for planting in Britain	2005	✓
FCIN078	The influence of soils and species on tree root depth	2005	✓
FCIN079	Use of sewage sludges and composts in forestry	2006	×
FCIN080	An update on nursery propagation and establishment best practice for larch in Britain	2006	✓
FCIN081	The principles of using woods for shelter	2006	✓
FCIN082	Choosing provenance in broadleaved trees	2006	✓
FCIN083	Managing mixed stands of conifers and broadleaves in upland forests in Britain	2006	✓
FCIN084	The potential for direct seeding of birch on restock sites	2007	✓
FCIN085	Evaluating biodiversity in fragmented landscapes: applications of landscape ecology tools	2007	✓
FCIN086	The role of forest genetic resources in helping British forests respond to climate change	2007	✓
FCIN087	Resistance of young conifers to feeding damage by pine weevil	2007	✓
FCIN088	Ten years of intensive environmental monitoring in British forests	2007	✓
FCIN089	Evaluating biodiversity in fragmented landscapes: the use of focal species	2007	✓
FCIN090	Forests and wood ants in Scotland	2007	✓
FCIN091	Greenspace establishment on brownfield land: the site selection and investigation process	2007	×

Appendix 7: List of Forestry England Policy, Procedure and Guidance Notes (PPGs)

Title	PPG
Tree Safety	PPG1
Procurement	PPG3
Monitoring of Establishment	PPG4
Deer Management	PPG5
Managing the Inventory	PPG6
Lower Impact Silvicultural Systems	PPG7
Timber Security PPG 8	PPG8
Thinning	PPG9
Timber Transport	PPG10
Firearms	PPG14
Safeguarding	PPG16
Contingency Planning	PPG17
Chainsaws	PPG18
Machine Certification	PPG19
Motorsport	PPG20
Forest Certification	PPG21
Accidents and Incidents	PPG23
Risk Assessments	PPG24
Personal Protective Equipment	PPG26
Plant Supply	PPG29
Countryside and Rights of Way	PPG30
Seed Supply	PPG31
Production Forecasting	PPG32
Resumptions	PPG34
Waste	PPG35
Forest Plans	PPG36
Noise and Vibration	PPG38
Construction Design and Management Regulations	PPG40
Conservation Data	PPG41
Sustainable Business	PPG43
Equality Impact Assessments	PPG44
Welfare Provision	PPG45
Venison Production	PPG48
Tree Health and Biosecurity	PPG50
Deadwood	PPG51
Timber Sales	PPG52
Working with Natural Processes	PPG53
Staff Volunteering	PPG54
Lone Working	PPG55
Habitat Regulations and Appropriate Assessments	PPG56
Historic Environment	PPG57

Title	PPG
Volunteer Management	PPG58
First Aid	PPG59
Feral wild boar and pigs disease management/ risk	PPG60
Managing Recreation Activities	PPG61
Managing Recreation Facilities	PPG62
Working from Heights	PPG63
Investment Programme	PPG64
Contract Management	PPG65
Provision and Use of Work Equipment	PPG67
Building Management	PPG68
Hazardous Substances	PPG69
Plantations on Ancient Woodland Sites (PAWS) Restoration	PPG70
IT Services	PPG71
Mink Control	PPG72
Grey Squirrel Control	PPG73

These publications are accessible to Forestry Commission staff only.

Appendix 8: UKWAS 5 (2024) – chapters and sections

1	Legal compliance and UKWAS conformance
1.1	Compliance and conformance
1.2	Protection from illegal activities
1.3	Genetically modified organisms
2	**Management planning**
2.1	Policy and objectives
2.2	Documentation
2.3	Consultation and co-operation
2.4	Productive potential of the woodland management unit (WMU)
2.5	Assessment of environmental impacts in existing woodland
2.6	Woodland creation
2.7	Woodland structure
2.8	Tree species selection
2.9	Introduction of non-native species
2.10	Silvicultural systems
2.11	Conservation
2.12	Protection
2.13	Conversion
2.14	Implementation, amendment and revision of the plan
2.15	Monitoring
3	**Woodland operations**
3.1	General
3.2	Harvesting and restocking
3.3	Forest infrastructure
3.4	Integrated pest management
3.5	Fertilisers
3.6	Fencing
3.7	Materials and waste
3.8	Pollution
4	**Natural, historical and cultural environment**
4.1	Statutory nature conservation sites
4.2	Conservation of ancient semi-natural woodland (ASNW)
4.3	Management of plantations on ancient woodland sites (PAWS)
4.4	Other priority habitats
4.5	Protection of conservation values in other woodlands and semi-natural habitats
4.6	Watershed management and erosion control
4.7	Maintenance of biodiversity and ecological functions
4.8	Maintenance of local native seed sources
4.9	Protection of cultural and historic environment sites
4.10	Game-rearing, shooting and fisheries management

5	People, communities and workers
5.1	Public access rights, permissive uses, traditional rights, and the health and wellbeing of local people, visitors and communities
5.2	Minimising adverse impacts
5.3	Local economy
5.4	Health and safety
5.5	Training and continuing development
5.6	Workers' rights
5.7	Insurance

This report contains a review of guidance and high quality research which together form modern best practice for building resilience in upland forestry. It provides direct links for digital access whenever possible. The report was sought by Forestry England but is likely to contain guidance of relevance to other British forestry sectors.

Forest Research

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