



Forestry Commission

THE UK FORESTRY STANDARD

The Government's
Approach to
Sustainable Forestry



FOREST SERVICE

AN AGENCY OF THE DEPARTMENT OF
AGRICULTURE AND RURAL DEVELOPMENT



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EDINBURGH: FORESTRY COMMISSION

FOREWORD

by the Prime Minister



Sustainable development means looking after our natural heritage so that our children, and the children of future generations, can also enjoy it. There is world-wide recognition that the protection and management of forests have a vital and distinct role to play. What is at stake is the conservation of a high proportion of the earth's species, the equilibrium of the atmosphere and climate, and the lives of millions of people who depend on forests for food and shelter.

“For a sustainable world environment we must get forest management right.”

All countries have a part in that, but we in the UK have a special responsibility to make sure that our forests are a renewable resource and make a positive contribution to the environment. In comparison with most temperate countries we have only a small proportion of our land under woodlands and forests.

We are a heavily populated industrialised society which places increasing value on the recreation and environmental potential of our forests and woods. At the same time, we continue to use enormous quantities of timber and wood products, importing more than 80% of our requirements. Others look to the UK to see whether we are adopting high standards of forest management to match our vital interest in the management and protection of forests in other parts of the world.

The UK Forestry Standard expresses a vision for our woodlands. It explains the setting in which we have developed guidance and regulation for forestry. The Standard recognises the great range of uses that we make of our woodlands.

But the UK Standard is more than a document describing good practice: we recognise the need to monitor UK forests, and to take steps to correct anything found to be going wrong. The Standard explains how we will achieve this through a combination of scientific study and national surveys. We are committed to publishing results, and to continued development of the Standard in the light of experience. The Standard has proved its worth in the years since it was first published in 1998. Not least in enabling the production of a national standard for forest certification purposes. This second edition of the UK Forestry Standard updates the first in the light of the devolution of forestry, and other developments and changes in practice implemented since 1998.



Tony Blair
April 2004



THE UK FORESTRY STANDARD

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THE UK FORESTRY STANDARD

AN OVERVIEW OF FORESTRY IN THE UNITED KINGDOM

This UK Forestry Standard has been developed specifically for forestry in the United Kingdom. The history of UK forestry and the nature of its woodlands differ fundamentally from those of the rest of Europe and Scandinavia. However, care has been taken to integrate the Standard with European and global protocols for sustainable development. The following outline of UK forestry provides a context for the Standard.

UK FOREST RESOURCES

Forest history

The woodlands of the UK reflect changes in land-use over several thousand years. During this period the land, which was once largely covered with woodland, was cleared of trees and used to satisfy the demands of an increasing population for timber, fuel and agriculture. By the beginning of the 20th century woodland cover was around 5%.

Today this figure has risen to 11.6% (2.8 million hectares) as the result of commitment to a steady programme of planting by successive governments, and the enthusiasm of many landowners and foresters. It is currently the policy of each country administration to increase the woodland area.

New woodlands can provide many benefits, including:

- expanding** timber and other woodland resources;
- enhancing** the beauty and character of the countryside, and contributing to the diversity and distinctiveness of rural and urban landscapes;
- enhancing and conserving** wildlife habitats;
- helping** to revitalise derelict and degraded land;
- creating** jobs and providing opportunities for economic diversification in rural areas;
- improving** the quality of life, especially in and around towns and cities by creating opportunities for recreation, health-promoting exercise, education and local community involvement;
- contributing** to the reduction of the level of carbon dioxide in the atmosphere.

Ownership and management

Around two-thirds of the UK's woodland resource is privately owned – by individuals, family trusts, charitable trusts or companies. Typically, woodlands owned by private and family interests are a part of mixed estates or are on farms. There are many thousands of small farm woodlands, but very few ownerships with more than 1000 hectares of woodland.

Management of woodlands for game is an important objective on many woodland estates and on some farms. Typically timber production is considered



important in the larger family estates and company owned forests. An increasing number of woods are managed specifically for recreational and conservation purposes by charitable trusts and private owners.

The remaining one-third of woodlands is owned publicly, the bulk of it managed by the Forestry Commission (FC) and the Department of Agriculture and Rural Development for Northern Ireland (DARD). In the main, these are ‘new’ forests established in the 20th century in areas of low agricultural value, particularly in the uplands, using mainly conifer species. Some woodlands are owned and managed by other public agencies including local authorities.

Semi-natural woodland

The United Kingdom has no natural forest, but has about 650 000 hectares of semi-natural woodland of which 288 000 hectares are classed as ancient and semi-natural (1.2% of land area). This is mainly broadleaved but includes the native pine forests of highland Scotland. Semi-natural woodlands are especially significant for wildlife conservation because they support a high proportion of rare and threatened species. They are also important for landscape and cultural heritage. Timber production and recreation are important uses of semi-natural woodland, but careful management is required to avoid conflict with special wildlife interests. Ancient semi-natural woodlands are especially valuable as some are remnants of the original post-glacial forest. Conservation of natural habitat is of prime importance.

Planted woodlands

Broadleaved tree species are a traditional part of much of the largely man-made landscape of the UK. Most of the common broadleaved tree species are either native to the British Isles, or have been established there for many centuries. They have been planted for a wide variety of purposes: landscape, amenity, timber production, shelter and game. Their quality as timber trees is variable but there is always a lively demand for good quality hardwood trees, and the broadleaved resource as a whole supports a small but viable sawmilling industry.

The commercial base of the forest industry relies heavily on introduced tree species, particularly Sitka spruce from North America. Scots pine is the only native conifer of economic significance. There are about a dozen conifer species in common forestry use.

Wood supply and wood processing

The annual wood supplies available from existing UK forests are expected to increase from the level of 10 million cubic metres achieved in 1999 (standing volume) to about 15 million cubic metres by 2015. This would provide 20–25% of the UK’s wood requirements, but the actual rate of progression depends partly on timber prices.

A rapidly increasing softwood supply from planted conifer forests in the uplands has encouraged a series of major investments by companies involved in the

manufacture of wood products. Over the last 15 years the British wood processing industry has attracted new investments of over £1 600 million. The industry now has some of the most advanced wood-using technologies in the world, and also makes increasing use of recycled fibre and reclaimed timber. However, new markets are required for low-grade hardwood and softwood and market development and value adding is a priority. There is considerable potential for low-grade timber and forest residues in biomass markets for heat and energy.

Employment

The forestry and primary wood processing industries provide employment for about 30 000 people. More than half are employed in harvesting, haulage and processing and this figure should increase with future growth in timber production. The total includes forest establishment and maintenance but also employment in forest recreation, game management and conservation. Additional jobs are created indirectly in tourism and support services, all of which contribute to the rural economy and to development.

Forest recreation

Forests and woodlands provide an ideal environment for many recreational pursuits and, with appropriate planning, are able to absorb the pressures of large numbers of visitors. Recent years have seen the development of new woodlands near to towns managed with the primary purpose of providing public access and recreation.

In addition to rights conferred by statute, many forest owners welcome – and some make special provision for – public access. Most publicly owned forests, including all FC and DARD-owned land, apply a policy of freedom to roam, and encourage a wide variety of recreational activities.

UK REGULATORY FRAMEWORK FOR FORESTRY

Policies

Throughout the period of forest expansion in the UK, successive governments have had a commitment to the creation and management of forests as a renewable natural resource. In the UK there has been continuous monitoring and re-assessment of forestry policy to reflect changing public attitudes, and the impact of socio-economic changes such as those associated with the Common Agricultural Policy. Forestry policy in England, Scotland, Wales and Northern Ireland is a devolved matter. The priorities of each administration are published in their forestry strategies and all are underpinned by the UK Forestry Standard.

After the commitments made at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, and at the second Ministerial Conference on the Protection of Forests in Europe (MCPFE) in Helsinki (1993), the Government formally adopted a forestry policy to promote sustainability. This was expressed in the following terms:



- the sustainable management of our existing woods and forests; and
- a steady expansion of tree cover to increase the many diverse benefits that forests provide.

Over the years a range of regulatory instruments and incentives have been developed to assist implementation of forestry policy. Some draw on legislation which is specific to forestry; others are based on legislation which has wider application. Forest management in the UK is subject to most of the legislation that regulates other commercial enterprises but, like agriculture, is outside the scope of planning law.

Powers

Regulatory mechanisms for forestry in the UK are primarily operated by the Forestry Commission (FC) in England, Scotland and Wales (who are responsible respectively to the forestry minister for the UK and the forestry ministers of the devolved administrations in Scotland and Wales) and by the Department of Agriculture and Rural Development for Northern Ireland (DARD). Forest Enterprise (FE), an agency of the FC in each country, manages the nationally owned forest estates of Scotland, England and Wales, while in Northern Ireland both regulation of forestry and management of state forests are undertaken by the Forest Service, an agency of DARD. Later sections of this Standard note the role of other bodies, such as local authorities and the statutory conservation agencies, in regulating forestry in particular circumstances.

INSTRUMENTS AND MECHANISMS

The following paragraphs describe the mechanisms through which the Government influences forest operations and protects tree health and quality.

New woodlands

More than half of the UK's woodlands have been created within the last century on land which has been deforested for many hundreds of years. Forestry expansion must be balanced with the needs of society and other land-uses and must respect the environment and the character of the landscape. This principle is embodied in the grant schemes referred to in Approval Mechanisms below. Environmental Impact Assessment regulations apply to new planting proposals, including short rotation coppice, which would have a significant effect on the environment – see page 6.

Tree felling and replanting

With certain exceptions, it is illegal to fell trees in Great Britain without prior FC approval. All cases of suspected illegal felling are investigated, and prosecution may ensue. FC and DARD Forest Service policy is that areas felled will be replanted or naturally regenerated except where felling is allowed for environmental improvement or to enable development authorised under planning regulations. Some flexibility is exercised in the application of the policy in order to support Government's wider aims for sustainable land-use.

The FC permits felling in private woodlands by granting a licence or by approving a long-term Forest Plan. The FC uses felling regulation in order to achieve diversity and improved forest structure. The FC also approves tree felling proposals in woodlands managed by FE. On Sites of Special Scientific Interest (SSSI), and Areas of Special Scientific Interest (ASSI) in Northern Ireland, the agreement of the statutory conservation agencies may be needed. All FC felling approvals are supported by the issue of a certificate confirming ‘approval in accordance with Government policy for the sound management of a renewable resource’.

Tree felling for the immediate purpose of carrying out approved development does not require a felling licence. Control in these circumstances is exercised by the local planning authority through the statutory development control process. The planning authorities can also place Tree Preservation Orders on trees and woodlands. In England and Wales, the FC will decide whether to grant a felling licence for trees covered by a TPO or that are in a Conservation Area, but will consult with the local authority about the application. In Scotland, all such applications are referred to the local authority for a decision. Although there is currently no provision for felling licences or Forest Plans in Northern Ireland, EC Directive 97/11 provides *inter alia* that deforestation for the purposes of conversion to another type of land-use may be subject to the Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) 2000. At present almost all timber sold for commercial purposes in Northern Ireland originates from woodlands where replanting is routinely carried out and managed for that purpose.

Plant health and forest reproductive materials

The FC and Forest Service exercise legal powers to prevent the entry of non-endemic pests and diseases of trees. Trade in ‘reproductive material’ (seed, plants or cuttings) of the 28 species of tree relevant to forestry in the UK is controlled by Forest Reproductive Material regulations implementing the EU Directive 1999/105EC on the marketing of forest reproductive material.

Information on forestry practice

The FC and Forest Service are responsible for promoting good practice in forestry management in the UK. Information is mostly contained in the UK Forestry Standard and its supporting FC/DARD publications (Appendix 4). Forestry grant and felling approvals are only given to schemes which conform to good practice.

Approval mechanisms

The principal mechanisms for granting forestry approvals are:

- forestry/woodland grant schemes;
- energy crops scheme (England);
- felling licences and Forest Plans (for the private sector);
- Forest Design Plans (for Forest Enterprise);
- approval under Environmental Impact Assessment regulations.



Most private woodland tree planting and natural regeneration takes place with the assistance of grants under the FC or the DARD grant schemes. To qualify for grants, work proposals must first be set out and approved in a 5-year plan. The grant schemes cover restocking as well as new planting and woodland management. Plans may be suspended where there is a serious departure from good practice. Where there is a failure to remedy the situation, grants may be reclaimed and, in Great Britain, the FC may serve a Restocking Notice after conviction for illegal felling. The FC and DARD monitor compliance with agreed proposals. They also use internal audits to ensure that their staff apply the right standards in grants, felling permissions and Forest Design Plans. Independent assessments are commissioned to evaluate the performance of particular instruments and mechanisms.

Environmental Impact Assessment

Proposals for new planting, deforestation, forest road construction and quarries that might have significant environmental impacts require an Environmental Impact Assessment (EIA). The FC and DARD give guidance to the proposer when the scope of the regulations or the need for an EIA is unclear. If an EIA is deemed necessary, the proposer must prepare an Environmental Statement which is made available to the public and to the environmental authorities. The Environmental Statement, and any comments received on it, are taken into account when the FC or DARD make their decision.

Procedures for consultation

Before issuing a felling licence or approving a Forest Plan, grant scheme or an FE plan, the FC enters any proposal for felling or for creating new woodland on a Register of New Planting and Felling. The Register can be viewed on the FC internet site at www.forestry.gov.uk/publicregister, or at FC conservancy offices. Weekly updates are also e-mailed to local authorities for public display. The FC allows time for anyone to comment before reaching a decision. Local authorities and other statutory bodies are also sent details of proposals for areas, or types of application, covered by formal consultation and notification procedures. If it is not possible to resolve a statutory consultee's objection, the FC cannot give a decision without first referring the matter to the appropriate forestry minister.

The above procedures do not negate requirements for owners to consult with other statutory agencies with regard to particular woods (e.g. the conservation agencies in the case of SSSIs). EIA, when required, is a formal process involving public consultation and specialist opinion from statutory bodies.

Monitoring national performance

The FC and DARD collaborate in the publication of an annual compendium of forestry statistics which gives information about woodland, forestry and primary wood processing in the UK. They also commission research studies, the National Inventory of Woodland and Trees and independent monitoring of UK forestry against this Standard and publish the results (see page 14). These reports all contribute to the process of reviewing the adequacy of Government instruments.

SUSTAINABLE FORESTRY IN THE UK CONTEXT

INTRODUCTION

The purpose of the UK Forestry Standard is to set out standards for the sustainable management of all forests and woodlands in the UK. It is the centrepiece of a system to guide and monitor forestry. The Standard is linked to the developing international protocols for sustainable forestry. It is used in the UK as a basis for the development of forest monitoring and is the basis from which the UK Woodland Assurance Standard was developed (see page 11). It can also be used for assessing compliance with management certification standards such as ISO 14000 and EMAS.

Guidelines agreed at Helsinki in 1993 and the subsequent Pan-European Criteria for sustainable forestry adopted at the third Ministerial Conference of the MCPFE in Lisbon in 1998 must be interpreted to put them into a UK context. International criteria and guidelines are expressed in broad terms which have limited practical value for managers. In developing The UK Forestry Standard, full account has been taken of existing guidelines and other publications which advise forest managers on recommended practice. The Standard takes into account the prime aspects of sustainable forest management: soils, water, air, production, biological diversity, workforce, communities, heritage and landscapes.

The UK Forestry Standard is supported by a number of instruments (see pages 4–6). These include: the forestry/woodland grant schemes, Forest Plans, Forest Design Plans, Felling Licence regulations and Environmental Impact Assessment regulations. These instruments, this Standard and its supporting publications are reviewed from time to time in the light of experience, monitoring and research.

Who needs to know about the Standard?

Anyone with an interest in how sustainable forest management is defined, implemented and monitored in the UK.

The forestry authorities in Great Britain and Northern Ireland. They will monitor forests by reference to this Standard.

Woodland owners, although many will find sufficient information in the guidance published to advise applicants for the forestry/woodland grant schemes or for a felling licence.

Forestry consultants and managers. Those dealing with large or complex woodland enterprises must be familiar with this Standard and its supporting publications (see Appendix 4).

Forestry trainers: so that forest workers and contractors understand those elements of the Standard which affect their work.

Only the people who work in and manage woodlands can deliver the requirements of this Standard.



Pages 8–18 set out the international background to sustainable forestry. They show where existing UK policies and practices fit in, and how the Standard works at both the national level and for the individual forest. The conceptual framework is shown in Figure 3 on page 12.

Pages 19–47 cover practical forest management in some detail. The general considerations of context and setting are dealt with before describing practices relevant to particular forestry situations. These descriptions are provided in a series of Standard Notes.

Finally, a Keyword Index (Appendix 4) provides the link between this Standard and its supporting publications. Other appendices provide information in general support of the Standard.

BACKGROUND TO THE STANDARD

The historical setting

In 1987, the World Commission on Environment and Development (The Brundtland Commission) published its report, *Our Common Future*. This focused international attention on the health of the world’s forests, on climate change and other globally significant environmental and development issues. The Commission introduced the concept of sustainable development, especially the ability to meet ‘the needs of the present without compromising the ability of future generations to meet their own needs’.

Sustainability

Sustainable development is ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.

(*Our Common Future*, 1987; report of the World Commission on Environment and Development.)

Sustainable forest management is ‘the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems’.

(Second Ministerial Conference on the Protection of Forests in Europe, Helsinki; 1993).

At the 1992 United Nations’ Conference on Environment and Development in Rio de Janeiro (The Earth Summit), world leaders expressed their commitment to sustainable development. The Conference adopted a number of commitments and agreements of relevance to forests: a Statement of Forest Principles, Agenda 21, the Biodiversity Convention, and a Framework Convention on Climate Change.

At the Helsinki Ministerial Conference in June 1993, European governments built on the Rio Forest Principles by adopting a set of guidelines for the sustainable management of European forests and for the conservation of their biodiversity. They interpreted the Rio principles for European conditions and articulated the common concern of European countries to manage their forests sustainably. The Helsinki Guidelines, which are set out in Appendix 1, included *General Guidelines for the Sustainable Management of Forests in Europe* and the *General Guidelines for the Conservation of the Biodiversity of European Forests*.

In 1994, the UK responded to these international commitments by publishing *Sustainable forestry – the UK programme* and three other, separate but linked plans: *Sustainable development – the UK strategy*; *Biodiversity – the UK action plan*; and *Climate change – the UK programme*. *Sustainable forestry – the UK programme* brought together the various elements from Government policies and programmes into a coherent whole, set in the context of the international principles and guidelines.

The United Nations Intergovernmental Panel and Forum on Forests (IPF/IFF) have, since 1995, been the focus for the promotion of the sustainable management of the world's forests. Both these bodies recognised that criteria and indicators provide a useful framework for assessing trends in forest conditions, policy formulation and evaluation. Building on the international recognition of the role of criteria and indicators, European Countries at the Lisbon Ministerial Conference in June 1998, adopted pan-European criteria and indicators. The agreed 'Pan-European Criteria' (PEC) are shown in Figure 1.

The establishment of the United Nations Forum on Forests (UNFF) in 2000 provides a continuing focus for the promotion of sustainable forest management and the further development of criteria and indicators globally. The programme of work adopted at the first session of the UNFF in June 2001 provided the framework for sessions 2–5. UNFF2 in March 2002 in New York focused on

Figure 1 SUSTAINABLE FOREST MANAGEMENT – CRITERIA

Following agreement on the Helsinki Guidelines (see Appendix 1), European countries adopted a set of 'Pan-European Criteria' (PEC) in 1998 to be applied to forests throughout Europe whatever their location or circumstance. The PEC are:

maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles;

maintenance of forest ecosystem health and vitality;

maintenance and encouragement of productive functions of forests (wood and non-wood);

maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems;

maintenance and appropriate enhancement of protective functions in forest management (notably soil and water);

maintenance of other socio-economic functions and conditions.



environmental aspects of sustainable forest management and included a high-level Ministerial Segment, which adopted a plan for implementing the IPF/IFF proposals for action. This provides a basis for assessing progress, highlighting best practice and identifying challenges to achieving sustainable forest management.

To support the work of the UNFF, the Collaborative Partnership on Forests, which consists of about 12 international forest-related organisations, institutions and instruments, was established in April 2001.

Recognising the links between forests and biological diversity, the Convention of Biological Diversity adopted a work programme on forest biological diversity in April 2002.

Since the mid 1980s, the UK has placed a high priority on the development of codes of good environmental practice in forestry. The private sector has supported these developments, and in 1985, played a pioneering role with the publication of *The forestry and woodland code* by the Timber Growers Association. In 1996, many organisations representing a wide range of business and environmental interests in UK forestry signed *The UK forestry accord*. The signatories shared common objectives and principles for the future management and development of forestry in the UK.

In 1995 the Government decided to prepare a UK Forestry Standard which would bring together in one document the criteria and standards for sustainable management of forests in the UK. This was to be done in a way which could be easily understood and would assist in the assessment of performance. Two public consultations were carried out; the first draft was circulated in June 1996 and the second in August 1997. As well as these public consultations, bilateral consultations took place with other government departments and major non-government organisations (NGOs). The UK Forestry Standard was first published in January 1998 and was welcomed by all stakeholder groups. This revision (2004) incorporates changes brought about by devolution and other developments.

The publication of The UK Forestry Standard facilitated the production of a certification standard (the UK Woodland Assurance Standard) and the environmental labelling of UK-grown forest products.

LINKAGE TO HELSINKI GUIDELINES AND PAN-EUROPEAN CRITERIA

The UK Forestry Standard is compatible with both the Helsinki Guidelines (Appendix 1) and the PEC (Figure 1). These guidelines and criteria necessarily give weight to some issues (such as soil erosion and fire) that are globally important but not usually critical in the UK. The use of native species is also an area of different emphasis: only one native conifer species (*Pinus sylvestris*) is commercially utilisable for timber, and as a consequence, non-native trees play a major part in UK forestry. Hence, the UK Forestry Standard has less to say about fire and forests for soil protection, and more about non-native species, than might be expected in other European countries.

The UK Woodland Assurance Standard

The UK Woodland Assurance Standard (UKWAS) is a voluntary certification standard for the independent certification of forest management in the UK. The standard was developed – and is managed by – a broad partnership of forestry, environmental and social organisations in response to increasing demand for products from certified forests. Woodlands that satisfy the requirements of the UKWAS are being managed to a standard recognised and endorsed by UK and international forestry, environmental and social organisations.

The UKWAS itself does not offer a product label; labelling depends on the type of accreditation held by a certifying agency and the existence of an audited chain of custody for wood between the certified forest and final wood product. Both forest management audits and chain of custody audits have to be carried out by accredited certification agencies. UKWAS was recognised by the Forest Stewardship Council (FSC) in October 1999 and the FSC label is now increasingly used on UK-grown forest products.

Environmental guidelines for forestry were introduced in the UK before the Helsinki Ministerial Conference. These guidelines were not, therefore, developed around the concepts of ‘criteria’ and ‘indicators’ but directly addressed practical management issues related to major components of the forest ecosystem or human resource. This practical approach has been deliberately retained as a basis for developing UK ‘criteria’ and ‘indicators’ in order to build on guidance already familiar to UK forest managers. The components represent the basic resources of forestry. Stewardship of these is readily matched with both Helsinki Guidelines and PEC (see Figure 2).

Figure 2 RELATIONSHIP OF BASIC RESOURCES TO THE PEC

Physical resources	Soils; water; air.	Without proper care of these resources none of the biological or human activities associated with forests are likely to meet the PEC.
Biological resources	Trees; biological diversity.	Forest ecosystems are complex and involve interactions between trees and other living things in and around them. Again, proper care and management of these living resources is required to meet the PEC.
Human resources	Workforce; communities.	All the PEC depend on work being carried out competently and safely. The ‘maintenance of other socio-economic functions and conditions’ acknowledges the need to take account of wood and non-wood productive functions and the interests of the community.
Cultural resources	Heritage; landscapes.	People recognise the value of artefacts and amenities found in forests. There is also a fundamental association between our culture (past and present) and the landscape, where woods often play a significant role.



Experience in the UK has shown that analysing operations by their impact on these basic resources is a practical means of assessing the effects of management. While some underlying rules have to be followed to avoid unacceptable risks to human welfare or irreversible damage to the environment, alternative management approaches are usually possible within the scope of this Standard. Choice should, however, be informed by the detailed guidance in the FC, Forest Service and Arboriculture and Forestry Advisory Group (AFAG)* publications which are relevant to almost all situations. Training and occupational standards information can be obtained through Lantra, the Sector Skills Council for the land-based sector.

Figure 3 THE UK FORESTRY STANDARD: CONCEPTUAL FRAMEWORK

Level	Governing framework	Supporting standards	Monitoring
International	<ul style="list-style-type: none"> ▶ United Nations Forum on Forests (UNFF) ▶ Convention in Biological Diversity (CBD) ▶ Ministerial Conference for Protection of Forests in Europe (MCPFE) and its Pan-European Criteria (PEC) ▶ EU Regulations 	<ul style="list-style-type: none"> ▶ Helsinki and Lisbon MCPFE Guidelines for the Management of Forests in Europe 	<ul style="list-style-type: none"> ▶ Monitoring of UK implementation and trends
UK and Country	<ul style="list-style-type: none"> ▶ UK and country regulations ▶ Country forestry strategies ▶ Country forestry grants and development, including research 	<ul style="list-style-type: none"> ▶ The UK Forestry Standard 	<ul style="list-style-type: none"> ▶ Monitoring by UK and country administrations ▶ UK Criteria and Indicators
Forest	<ul style="list-style-type: none"> ▶ Forest Management Plans ▶ Forest operations management ▶ Forest certification 	<ul style="list-style-type: none"> ▶ The UK Forestry Standard and supporting Guidelines ▶ UK Woodland Assurance Standard 	<ul style="list-style-type: none"> ▶ Monitoring by UK and country administrations and monitoring by certification bodies

*Formerly published by the Forestry and Arboriculture Safety and Training Council (FASTCo).

SUSTAINABLE FOREST MANAGEMENT IN THE UK

CRITERIA AND INDICATORS

Aspects of Sustainable Forest Management (SFM) in the UK are tabulated on pages 15–18. They are expressed in terms of maintaining or improving the quality or quantity of the basic resources (see Figure 2). To allow progress to be monitored, it is necessary to have measurable or assessable ‘indicators’. At the level of the Forest Management Unit (FMU) (see Figure 4), ‘indicators’ are expressed in terms of evidence that planning and operational practice complies with this Standard or its supporting publications, and management plans.

Figure 4 ASSESSING SUSTAINABLE FOREST MANAGEMENT (SFM)

	Explanations and examples
Indicator	A measure related to SFM. This may be a measurement of resource level or evidence relating to a feature of management practice.
Standard	The UK Forestry Standard identifies, through a descriptive process, the forestry practices which are appropriate (or inappropriate) in particular situations. It is not a product certification standard although it has been the basis for the development of the UK Woodland Assurance Standard (see box on page 11)
Forest Management Unit (FMU)	The smallest self-contained unit of management for decision making about the production of goods or services and changes affecting local social and environmental conditions. [Examples: a farm, a single estate, an FE Forest District.]

MONITORING

In October 2002 the Government published a set of *UK indicators of sustainable forestry*. The selection of indicators takes account of experts’ views and a public consultation. The indicators will provide a common baseline for measuring past and future trends at UK and country level.

Monitoring The UK Forestry Standard will involve consideration of a wide range of survey data and research findings. Some of the information required will come from national forest surveys (such as the National Inventory of Woodland and Trees), some from countryside surveys in which forestry is only one component (such as surveys of water quality in individual river catchments), and some from assessment of UK forestry practice. In the latter case it will be necessary to take account of widely differing objectives and priorities in order to reach a proper judgement of the sustainability of forestry practice.

The view of progress at FMU level will be formed through special studies and sample surveys commissioned periodically by the FC and DARD. The aim of the surveys will be, firstly, to confirm whether practice in individual FMUs is appropriate for sustainable forest management (as described in this Standard) and to identify areas of significant weakness in the management plan, or in its execution. Secondly, the surveys should reveal whether the Standard itself is correctly describing sustainable forest management. The surveys will be carried out by independent assessors using a protocol set by the FC and DARD. Assessors' reports will be published, together with the response of the FC and DARD. (Details of individual samples and their owners will remain confidential.)

Results from monitoring exercises, in all their different forms, will influence policy, regulations, incentives and guidance, including the Standard itself.

Requirements and FMU Indicators for The UK Forestry Standard

These are set out in the table on pages 15–18

- The first column of the table sets out key aspects of sustainable forestry in the UK. They are grouped by components representing the basic resources of forestry in the UK.
- The second column shows the requirements for SFM performance.
- The third column shows indicators appropriate at the level of the FMU. These are the management practices which will be surveyed to monitor FMU performance. An FMU management plan is the basic reference for a monitoring assessment. The plan should make clear the aims and objectives of the forest owner.

The management plan need only be as detailed as the owner wishes to make it and the complexity of the FMU demands. Individual preferences and unique situations will mean that management plans will have different aims and objectives. The owner of an FMU with only a small wood may have limited objectives, and the criteria to be considered in detail would be equally limited. In the case of larger FMUs the implications of several different aspirations may have to be considered in order to arrive at balanced objectives. While compromise is accepted as necessary in these circumstances, loss of potential benefits through neglect or mismanagement must be avoided.

Forestry businesses must comply with a large number of laws and regulations. The vast majority are common to all occupiers and commercial enterprises in the UK, some are of special relevance to land-based enterprises, and a few are specific to forestry. Laws are administered by designated authorities and departments of government. Some Acts and Regulations important to forestry are listed in the FC/DANI Guidelines and other publications supporting this Standard (see Appendix 4), and it is these that will influence any monitoring assessments.

ASPECTS OF SUSTAINABLE FOREST MANAGEMENT	REQUIREMENTS OF SUSTAINABLE FOREST MANAGEMENT	FOREST MANAGEMENT UNIT INDICATORS
 <ul style="list-style-type: none"> • Forest soil condition 	<p>Forest soil condition is stable or improving towards a more stable condition (and the improvement is not to the detriment of important semi-natural habitats).</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • the use of cultivation, drainage, herbicides, pesticides and fertilisers is selective and potential impacts are taken into account; • anti-erosion precautions are planned and carried out in vulnerable situations; • the pollution of soils is avoided by using the correct procedures for handling and disposing of substances and containers; • appropriate establishment, maintenance, harvesting and roading methods are chosen to minimise soil damage; • silviculture complements other measures designed to improve soils of damaged or reclaimed sites.
 <ul style="list-style-type: none"> • Water quality • Water yield • Water discharge patterns 	<p>Water quality is protected or improved, water yields are maintained above any critical level and water discharge patterns are disturbed only when unavoidable, and all options have been explored.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • local liaison takes place when appropriate and agreements for water are respected; • an acceptable standard of forest design is applied to water margins; • opportunities are taken to improve riparian zones in the course of forest operations; • all operations are planned and are carried out to minimise disturbance to watercourses and to avoid pollution and siltation; • emergency pollution control measures are in place when high risk operations are carried out.



ASPECTS OF SUSTAINABLE FOREST MANAGEMENT	REQUIREMENTS OF SUSTAINABLE FOREST MANAGEMENT	FOREST MANAGEMENT UNIT INDICATORS
 <ul style="list-style-type: none"> • Net carbon sequestration • Air pollution 	<p>The values of forests as sinks and stores of carbon are recognised in policies and protected and enhanced in practice. Pollution is avoided by using the best available techniques which do not entail excessive costs.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • site potential for biomass increment is being maintained or improved within the limitations of other objectives; • lop and top burning is used only for demonstrable management benefit after the consideration of other potential impacts; • waste materials are disposed of in a manner approved by the appropriate authority.
 <ul style="list-style-type: none"> • Timber production • Other production • Contribution to the economy 	<p>The supply of timber and other forest produce for industrial use is available at the levels indicated in long-term forecasts, or is increased without reducing the annual increment potential of future crops.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • where the main objective is commercial timber production, woodlands: <ul style="list-style-type: none"> - are well stocked - have a high proportion of productive species suited to the site - are felled without excessive waste of marketable material and with knowledge of the relationship between planned production and future yields; • in woodlands where timber production is not the main objective: <ul style="list-style-type: none"> - felling areas are regenerated without loss of site productivity potential; • in all woodlands: <ul style="list-style-type: none"> - opportunities to realise future volumes and values of forest products have not been compromised unnecessarily - measures are taken to protect woodland from the consequences of damaging winds, fire, mammals, pests or diseases - material inputs are chosen, wherever possible, using recommendations based on information about the balance between environmental burdens and benefits.

ASPECTS OF SUSTAINABLE FOREST MANAGEMENT	REQUIREMENTS OF SUSTAINABLE FOREST MANAGEMENT	FOREST MANAGEMENT UNIT INDICATORS
 <ul style="list-style-type: none"> Nature conservation 	<p>Biodiversity in and around woods and forests is conserved or enhanced, and:</p> <ul style="list-style-type: none"> species and habitats subject to EU Directives or priorities of the UK Biodiversity Action Plan are conserved or enhanced; important, but previously disturbed, semi-natural habitats are restored, where practicable. 	<p>Evidence that:</p> <ul style="list-style-type: none"> opportunities for nature conservation are considered and accommodated; conservation of biodiversity is not unreasonably compromised by other management objectives and methods; designated sites and sensitive areas for threatened or rare species and genotypes are clearly recorded (sometimes confidentially), and protected; semi-natural sites are identified, opportunities for new native woodlands are considered and the principles of good management are applied; statutory conservation agencies are consulted when appropriate for designated sites; the impacts of forest operations on neighbouring environments are fully taken into account; afforestation of, or irreversible change to important habitats is avoided.
 <ul style="list-style-type: none"> Forestry workforce competency and safety 	<p>Safe and efficient practices are promoted and their effectiveness kept under review.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> only personnel with relevant qualifications, training and/or experience are engaged to carry out any work; safe working practices are adopted with reference to the assessed level of risks, safety regulations and published safety guidance; a management system is in place to evaluate and monitor risk and safety compliance, and to ensure that remedial action is taken if necessary; skills training needs are kept under review and acted on where appropriate.



ASPECTS OF SUSTAINABLE FOREST MANAGEMENT	REQUIREMENTS OF SUSTAINABLE FOREST MANAGEMENT	FOREST MANAGEMENT UNIT INDICATORS
 <ul style="list-style-type: none">• Rural development• Access and recreation• Quality of life in and around forests• Increased awareness and participation• Community involvement• Other land-uses	<p>Opportunities are enhanced for:</p> <ul style="list-style-type: none">- rural development;- access and recreation;- quality of life;- increased awareness and participation;- community involvement;- skills training. <p>Important agricultural resources are protected.</p>	<p>Evidence that:</p> <ul style="list-style-type: none">• access is available along public rights of way and permissive routes in accordance with the appropriate legislation;• information is promulgated about recreational facilities and access;• opportunities for walking and other recreational pursuits in woodland are taken into account;• activities associated with recreation do not unnecessarily compromise any future benefits of forest products or nature conservation;• efforts are made to mitigate the consequences of vandalism or other antisocial behaviour in woodlands;• requests to use woodland for environmental education have been reasonably considered;• consultations and involvement of communities are reasonably accommodated, especially in relation to work opportunities.
 <ul style="list-style-type: none">• Conservation of heritage features  <ul style="list-style-type: none">• Landscape quality	<p>Important heritage features are protected. Due account is taken of cultural, historic or designed landscapes. Landscape quality is enhanced.</p>	<p>Evidence that:</p> <ul style="list-style-type: none">• important sites are clearly recorded;• sound principles for integrating archaeological sites in woodland are adopted;• archaeological sites are protected and damage is avoided;• landscape principles of forest design are used;• the cultural and historical character of the countryside is taken into account when creating new woods and when making changes to existing woods.

ACHIEVING GOOD PRACTICE IN UK FORESTS

INTRODUCTION

This part of the Standard is concerned with describing good forestry practice which supports the national objective of sustainable forestry. It provides a description of the legal and environmental context in which decisions need to be taken, followed by a series of six Standard Notes. The latter broadly describe the practices appropriate to a variety of operations and management systems, and are linked to supporting publications which give more detailed advice (see Appendix 5). It is neither possible or desirable to set a rigid list of performance standards because of the wide variety of possible forest situations. Pages 19–47 thus provide a reference against which practice can be assessed. Proposals and practices which fall significantly outside the range of those included in this Standard might be acceptable to the forestry authorities under some circumstances and well reasoned argument will be considered on a case-by-case basis where necessary.

It is intended that the forestry practices advocated in this part of the Standard will be delivered through the existing FC or DARD mechanisms, i.e. the forestry/woodland grant schemes, Forest Design Plans, Felling Licences, Forest Plans and Environmental Impact Assessment – supplemented on occasion by those of other government agencies and local authorities. Many woodland owners will find sufficient information to gain grant approval in the guidance published in support of the forestry/woodland grant schemes. Forestry consultants and managers dealing with large or complex woodland enterprises must be familiar with this Standard and its supporting publications (see Appendix 4).

It is important that forestry training is planned with reference to this Standard and its supporting publications. Forest workers and contractors should understand the elements of the Standard which affect their work.

WOODLANDS IN A WIDER SETTING

A woodland owner's objectives play a crucial part in determining management priorities. Good decision making will involve consideration of economic, environmental and social factors. Evaluating and balancing these will, in some cases, require significant adjustments to initial plans and ideas.

Environmental assessment

Although the creation of new woodland is usually encouraged, a formal Environmental Impact Assessment (EIA) may be required if there is likely to be a significant impact on the environment. Owners will then need to submit an Environmental Statement to the FC or DARD for consideration.

Designations and legal restrictions

There are a number of designations and classifications which can apply to land,

or to the plants and animals living there. More than one of these may have significance to a forestry proposal. In some areas local authorities have prepared Indicative Forestry Strategies (IFS) or other Area Plans which provide guidance on land-use change. These may make it easier for an owner to assemble information and to assess whether the locality is likely to be sensitive to a particular proposal.

Designations, special plans and indicative classifications which may affect forestry proposals are set out in Appendix 2. Information on particular designations can be obtained direct from the responsible agency. The FC and DARD may also be able to provide the necessary information or advice.

Agriculture

Government policy has been to encourage woodland planting ‘down the hill’ to take land out of agricultural production in order to reduce food surpluses produced under the Common Agricultural Policy. In practice, this has encouraged the planting of trees in areas of intermediate agricultural value, where forest with good potential can take the place of the less profitable forms of agriculture. Prime agricultural land is an important national asset. In Scotland, there are also a number of specifically identified and mapped areas where upland afforestation is severely constrained to ensure that the hill sheep industry can continue to thrive. Proposals to plant in these areas are subject to consultation with the appropriate agriculture department. The implementation of the EU Rural Development Regulation should result in greater diversification of farming to include activities such as tourism and forestry.

Landscape impact

Woodlands are a highly valued and visible component of many landscapes. Some land designations, such as National Parks, signal the need for special attention to be paid to landscape issues, while publications such as ‘countryside character maps’ in England will help in assessing the wider impact of woodland proposals. Careful thought is required before changing the appearance of existing woodland (e.g. through felling and restocking), or before changing the landscape by creating a new wood. Impacts should be evaluated for different stages of development in the years ahead, taking into account viewing direction, distances, scale and the number of people whose enjoyment could be affected (see the FC landscape guidelines – listed in Appendix 4).

Examples of situations where change may have a high landscape impact:

- sites on highly prominent landforms;
- sites within designed landscapes of heritage importance such as parkland and woodland around country houses;
- sites visible from well-known viewpoints and travel routes;
- sites which form, or are part of, an important scenic outlook from towns and villages;
- areas used intensively for recreation;
- sites which are recognised as having a special atmosphere, or which are part of larger areas of highly valued character.

Ecological impact

Forests and woodlands provide a rich and diverse habitat for wildlife, much of which benefits from the varied conditions associated with normal management activity. Some species and habitats require special consideration however, such as those associated with open ground and water. In addition to the *Forest nature conservation guidelines* there are a number of FC publications referring to particular habitats and key species.

Many sites of ecological significance have been designated as SAC, SPA, NNR, SSSI, or ASSI (see Appendix 2). These are of great importance and their management will usually be subject to plans formally agreed by the nature conservation agencies. Even when no plan has been agreed, the nature conservation agencies must be consulted before carrying out any ‘potentially damaging operation’ that they have listed.

Ancient and semi-natural woodland and other sites of high ecological value should be identified and taken into account in the formulation of plans. Such sites are often those which have been relatively undisturbed in the past by cultivation, drainage or fertilisation. Some may be particularly valuable because they link to areas supporting rare species and have potential to be used or colonised by them. Recently created ‘new native woodlands’ need careful protection if their desired character is to be achieved.

In areas where important open ground habitat is rare, it can sometimes be successfully restored by clearance of plantations. Restoration of these habitats may form part of the UK Biodiversity Action Plan and owners considering such a proposal should discuss it with the FC or DARD and the appropriate conservation agency.

Examples of sites where ecological value is or may be high:

- semi-natural woodland;
- areas with habitats or species in Red Data Books or which are priority habitats and species in the UK Biodiversity Action Plan;
- ancient woodland sites converted to plantation but which still have elements of semi-natural vegetation;
- semi-natural open ground habitats, especially where extensive or of a diverse or rare type;
- woodlands with a wide range of habitats, structures, species or old trees;
- woodlands with a high proportion of native tree species;
- waterbodies, streams and wetlands possessing a ‘natural’ character.

Archaeology and cultural heritage

Scheduled Ancient Monuments and their settings are protected by law. These and other important archaeological sites and historic and cultural features should be protected (see FC *Forests and archaeology guidelines*). Our links with, and understanding of, the past, and our appreciation of the present are thereby maintained. Woodland can obscure many of these features and the best

opportunities for identifying and incorporating them in the woodland plan occur at initial planting. Unscheduled sites are described and mapped on local Sites and Monuments Records held by county archaeologists (England), local authority archaeologists (Scotland), the Welsh archaeological trusts and the Environment and Heritage Service (Northern Ireland). These organisations may have, or know of, old maps and aerial photographs which show the history of the site. They can also advise on general areas of archaeological interest where less obvious, and possibly buried, features require expert survey before planning a new woodland. Local archaeological societies are another source of information and will sometimes be able to give assistance in marking out sites and in archaeological surveys.

Examples of the variety of archaeological and historic features are:

- signs of ancient habitation, burial and fortification;
- standing stones;
- isolated ruins, deserted farming communities, bridge and ford sites;
- memorial stones, boundary stones and milestones;
- boundary banks, ditches and walls of political or past management significance;
- individual trees, hedges, avenues, clumps of trees, and woods of historical interest or which are traditional landmarks;
- sites of old mills, kilns and early mining activity;
- recent structures or artefacts of potential interest to future generations.

Water resources and the aquatic environment

In the UK current consultation arrangements and management practices detailed in the FC *Forests and water guidelines* are designed to avoid or minimise adverse impacts on water supplies and the aquatic ecosystem. Existing forests often need design adjustment at the stage of felling and restocking in order to meet current requirements. In some areas, special precautions or restrictions require discussion and agreement with the relevant water regulatory authority. In responding to consultation on afforestation, it is sometimes necessary for the water regulatory authority to take a strategic view of the cumulative impact of forests on individual water catchments and on downstream interests. This is particularly the case in ‘Critical Load Areas’, where acidification is a key concern and where an otherwise sound proposal for afforestation may have to be turned down. The EU Water Framework Directive 2000 establishes an approach based on River Basin Districts. This approach is likely to result in changes to some of the existing guidance when regulations to implement the Directive are put in place.

Examples where particular attention is needed for water:

- to avoid excessive shading of watercourses;
- to minimise the effects of cultivation and drainage on critical base and peak stream flows;
- to consult with the relevant water regulatory authority if afforestation proposals fall within ‘Critical Load Areas’;

- to avoid nutrient enrichment, pollution, erosion, siltation and structural damage to water courses;
- to locate and protect domestic drinking water supplies and pipes.

Community interests

Many of the interests of the wider community are expressed through the national systems of land, conservation and heritage classifications. Taking account of more locally expressed interests can be rewarding for both the landowner and the community. Ways of successfully initiating local liaison and discussion are described in the FC Practice Guide *Involving communities in forestry*.

Communities are likely to have an interest in access, recreation, local employment, local heritage and environmental improvement. In some areas ‘community’ woodlands are being planted specifically to benefit local people. It is worthwhile involving the community in the planning and maintenance of a woodland, and in its use for recreation or education. This kind of dialogue can optimise benefits and avoid conflict. It also helps if community and interest group leaders know who to contact if the need arises.

In remote rural areas, work in the forest can provide much needed employment. In other situations, communities value the positive impacts of woodland on the landscape, and its potential as a recreational resource for visitors.

The forestry authorities can assist in the process of communication. For example, the FC makes available a public register of new planting and felling proposals. Other than in Forest Plans, the Government’s grant and licence schemes do not require owners to discuss their ideas directly with local community representatives, but it is recommended that such discussion takes place periodically. In Northern Ireland, local representatives meet regularly with officials at meetings of the District Consultative Committees. Forest Enterprise has a growing range of opportunities for people to get involved in the forest planning process through local forest design plan development.

THE WOODLAND PLAN

The woodland plan is an essential management tool. It may build on the detail included in grant schemes or Forest Plan proposals but should incorporate additional information and make provision for record keeping and revision. When necessary, information in the basic plan will subsequently be elaborated into plans for individual operations.

In large forests a small area such as a single valley or hillside may be an appropriate planning unit. It is essential to use an up-to-date map and to collect information about the woodland and its context as described in pages 19–23. The appraisal should include an assessment of the significance of rabbit, squirrel and deer populations on the area and in the vicinity, and any local management strategies to control them. Management objectives can then be appraised along with alternative ways of achieving them, always bearing in

mind the local site conditions and the wider context of the wood. The prescriptions of the plan and the way operations are carried out are likely to be influenced by regulations, specialist advice and the availability of various types of grant aid and other assistance.

All site information pertinent to management should be recorded on maps. In addition to the normal geographical features, physical boundaries and existing stands of trees, maps should show safety hazards, designated areas, areas of high ecological value, archaeological sites, rights of way, access routes and recreational areas.

- Simple, well-annotated maps may be the only planning and recording document needed for a small wood.
- More structured plans are needed for larger woods or complex situations in order to explain and record intentions and to simplify future updating. These plans should include a statement of management objectives and record the prescriptions using schedules of stands (compartments) and key features linked to the map.
- In some cases annotated photographs, landscape drawings or computer landscape simulations are needed to develop soundly based proposals, illustrate them effectively, and provide a visual reference against which to monitor progress.
- Plans should have review dates set either at fixed intervals (usually five or ten years) or linked to particular stages of development (e.g. after felling)
- The plan review may need to include examination of additional systems of monitoring used for parts of the area (e.g. records of changing conditions in the semi-natural woodland areas).

Plans should take account of the site factors that are likely to influence growth rates, choice of silvicultural treatment and potential woodland diversity. Among the most important of these are: variation in ground vegetation and soil, topography, elevation and exposure. Owners should assess the long-term financial and environmental impacts of alternative approaches before finally deciding on detailed proposals for the short term.

Planning individual forest operations involves consideration of available techniques and resources and the potential environmental impacts of the work. This often requires a detailed study of site features and site conditions and how they might change with the weather and season. Direction of ground cultivation or timber extraction, routes for machinery, location of fuelling points, operator safety, the need for warning signs, notification of neighbours and statutory authorities are points to be considered for even a modest scale of operation.

THE STANDARD NOTES

The Standard Notes are based on the principle that each situation is unique and demands individual attention in order to develop appropriate plans and working practices. Provided forestry is practised within the framework of this Standard and its supporting publications, owners are encouraged to adopt the methods most appropriate to their objectives.

The Standard Notes are a reference for identifying acceptable options for management. They are a synthesis of the most important guidance contained within the FC/DARD Guidelines and other publications. **The Keyword Index (Appendix 4) links the practice described in the Standard Notes to these supporting publications.** New or revised guidance published after this edition of the Standard must be given precedence.

The Standard Notes:

-  1. General forestry practice
-  2. Creating new woodland
-  3. Creating 'new native woodland'
-  4. Felling and restocking planted woodland
-  5. Managing semi-natural woodland
-  6. Planting and managing small woods



This Standard Note (SN) identifies the basic principles of good practice which apply to most forest situations. See SN2–6 for more information on aspects of good practice in a variety of woodland situations.

Many regulations cover the construction and safe use of machines, the approval and use of herbicides and pesticides, and environmental protection. Such regulations have statutory force. Guidance such as that set out in the AFAG Safety Guides, FC and DARD Guidelines and Guides provide best practice information for the UK. They explain how work can be undertaken efficiently while ensuring personal and public safety and minimising adverse environmental impacts.

Precautions applying to all types of operation

- Ensure that safety precautions, equipment and competence are appropriate to the risk, and that safety procedures are comprehensive and remain effective.
- Be prepared to deal with accidental spillages and the proper disposal of waste materials and equipment.
- Ensure reliable precautions are in place for the general protection of water supplies, aquatic ecosystems, wildlife and other vulnerable features of the environment.
- Make specific arrangements for the protection of archaeological sites, protected habitats and protected species of wildlife. If discoveries are made in the course of operations avoid further disturbance and obtain expert advice.
- Keep public rights of way open (or legally suspended/diverted) and respect private rights of access. Take account of permissive or customary use.
- Minimise inconvenience to neighbours and the public.
- Ensure that plans continue to be appropriate in changing conditions and are understood by all those involved.

Health and safety

Everyone involved in forestry work has health and safety duties and responsibilities. Employers, the self-employed and those in control of work in forestry have duties under the management of Health and Safety at Work Regulations 1999. Timber growers, purchasers, contractors and subcontractors all have a part to play in making sure people's health and safety is not put at risk.

Planning and preparation for forest operations

A methodical approach to planning forest operations increases efficiency and prevents many problems developing. Site checks are particularly important when there has been little work in that part of the wood for a long time, or when using a new method.

- Make sure that site planning and the conduct of operations take due account of possible on-site and external impacts e.g. to ancient monuments, access routes, downstream areas, wildlife and people.
- Check and comply with any requirement by a government body or statutory undertaker for notification or consultation, and decide whether neighbours need to be notified.
- Make sure that staff and contractors clearly understand safety precautions, plans for the protection of the environment and emergency procedures.

Cultivation and drainage

Where ground cultivation or drainage are necessary, the specification, layout and working method must be designed to avoid erosion and consequent impact on water quality, aquatic ecosystems and other wildlife habitats.

Some drainage systems in established crops and along forest roads do not meet current standards and should be upgraded when the first opportunity arises. (Once trees have closed canopy the first opportunity will usually be at time of felling.) Silt traps or other protection should be installed and maintained where it is impractical to change alignments. The following are key principles for drainage systems; see the FC *Forests and water guidelines* for design guidance.

- Check for, and comply with, any relevant drainage legislation or restrictions on title deeds.
- Design drain gradients to avoid erosion during storms, with silt traps at locally steep sections or to break up unavoidably long runs in soils susceptible to erosion.
- Design spill or filtration areas between drain ends and watercourses.
- Avoid, wherever possible, the discharge of forest drainage systems into roadside drains.
- Avoid damage to the hydrology of wetlands of conservation or heritage value and take opportunities to restore those previously drained but which have not been successfully planted.

Establishment and protection

General principles of good practice in establishment and protection are described below. The special requirements for ‘new native woodlands’ and semi-natural woodland are in SN3 and SN5.

Open Space

The design and management of open space is described in SN2. Opportunities should be taken to improve the open space content of existing forests to match that expected in new forests.

Planting and natural regeneration

When planning planting and regeneration, consider the risk of damage (e.g. by



livestock, rabbits, deer, squirrels and people). Protective measures will be required in proportion to the risk and the probability of achieving effective control or protection. Vulnerability and need for action can vary according to tree species. In many parts of the country the greatest risk of damage is from deer.

- Promote the potential quality and value of timber by adopting initial tree spacing close enough to induce straight stems and the early suppression of heavy side branching. [FC and DARD advise that the established crop should comprise 2 500 evenly distributed trees per hectare. Exceptions are made mainly for small amenity planting, planting of poplar and semi-natural woodland.]
- Diversify the landscape and habitat of conifer woodlands by careful design of open ground and strategically sited broadleaved species. Native trees or shrubs should be favoured where suitable for other management objectives.
- Plant at least 5% of the area of any new conifer woodland with broadleaved trees or shrubs. This proportion may be reduced if the planting is an extension of a wood already containing significant areas of broadleaves or if increasing other types of habitat with a greater priority for ecological diversity.
- Increase the amount of broadleaved trees and shrubs present in existing conifer woods to at least 5% in the course of restocking.
- Increase diversity in uniform conifer woodlands by planting at least 5% of the area with a different conifer species making good use of the greater opportunities for species diversification and improved age structure on areas with fertile mineral soils. Where this is not suitable, an alternative would be to increase the above levels of broadleaved trees, shrubs or – on very poor sites – of open ground, planning them to maximise environmental benefit.
- Take special care with selection and layout when planting mixtures of species or clones, particularly where part of the mixture (or nurse crop) will later have to be removed. The effects of different growth rates and access for thinning need to be considered.
- Take care when planting mixtures (especially evergreen conifers with broadleaves or larch) to avoid obtrusive geometric patterns in the landscape.
- Adjust the edge structure of planting or natural regeneration to improve its appearance in the landscape, benefit habitat development, and promote the stability of the crop.

Protection and maintenance

- Minimise the use of fertilisers, pesticides and herbicides by using them only according to the specific needs of the site, and only where other options are either not available or are uneconomic. Select products approved for use in that situation and apply at recommended rates, limiting application to the target area.
- Protect and maintain planting and natural regeneration (with additional planting or respacing where necessary) until establishment is achieved at the planned stocking and spacing.
- Where fencing is necessary, erect and maintain fences on alignments which respect the landscape, public rights of way and other access routes, and adopt

good practice to minimise undesirable impacts on wildlife such as badgers, deer and woodland grouse.

- Ensure that ride, road edge and open space management regimes promote, or are sympathetic to, wildlife conservation especially where they support rare or endangered species.
- Co-operate with neighbours in the control of grey squirrels, deer, rabbits and feral goats, e.g. by supporting local management groups.
- Keep important archaeological sites clear of natural regeneration of trees and shrubs.

Tree harvesting operations

Harvesting operations are usually the most resource intensive and potentially dangerous of forest operations. They can also have a very significant environmental impact on the forest and surrounding ecosystems. Good silviculture and cost-efficiency must be combined with care for people and the environment.

The timing of the operation will usually be determined by financial or market considerations and the availability of expertise and equipment. However, timing must be adjusted to protect certain species, especially in their breeding season. If in doubt the nature conservation agencies should be asked for advice.

The decision to use whole-tree harvesting systems requires careful consideration to avoid soil degradation on some sites. Current recommendations are given in the FC Practice Guide *Whole-tree harvesting: a guide to good practice*.

Planning the harvesting operation

- Adjust species mixtures by specifying thinning to promote the required composition, especially when conifer nurses have been planted with a planned broadleaved or mixed main crop.
- Identify potential hazards to workers and the public.
- Liaise with the highway authority and police about felling near public highways.
- Select equipment and methods which will allow all parts of the site to be harvested without danger to people or the environment.
- Make allowance for changes in weather and therefore in site conditions during the operation.
- Identify any improvements needed for satisfactory machine access, stacking and refuelling.
- Decide how to safeguard sensitive or easily damaged parts of the site and ensure that only the intended trees and shrubs are felled.
- Specify how the site is to be left on completion of harvesting: do not specify burning of lop and top unless there is a clear management benefit and the operation can be safely carried out, taking into account any potential risk or nuisance to adjoining areas and the community.
- A licence to burn lop and top is not needed but a written application must be made to the EA or SEPA to obtain permission. The maximum allowed is 10 tonnes in any 24 hour period.



Control of harvesting operations

- Do not allow trees to be felled into watercourses and immediately remove any accidental blockages caused by the operation.
- Prevent erosion by using brush mats and culverts to avoid rutting and blocked drains. Take prompt remedial action if an erosion risk becomes apparent.
- Clear drains as extraction progresses through each part of the site.
- Remove temporary culverts as soon as machine operations in felling and restocking are complete.
- Keep harvesting machinery off archaeological sites and operate within the restrictions planned to protect other sensitive areas.
- Monitor effectiveness of safety controls.

Forest roads and tracks

The term 'forest road' applies to any deliberate formation of a vehicle route involving the movement or removal of soil across its whole width. The general requirements of good practice described for forest work in this SN include work on forest roads.

- Obtain necessary planning and highways consent for new roads and access to the public highway, and carry out an Environment Impact Assessment for forest roads if necessary.
- Locate roads and bridges to respect landscape character as well as the balance between the cost of off- and on-road haulage.
- Blend road alignments with landform.
- Avoid archaeological sites and disturbance of protected habitats and species.
- Design road surfaces, road drainage and harvesting machine access points to avoid erosion and other adverse impacts on water quality, watercourses and wildlife habitats.
- Ameliorate the visual impact of cut and fill in sensitive locations.
- Incorporate turning points, loading and passing bays in the design of any road intended for later harvesting use.
- Ensure that the forest road system is legally and physically integrated with public roads, rights of way and other routes which it joins or crosses.

CREATING NEW WOODLAND

STANDARD NOTE 2

This Standard Note (SN) sets out best practice for the creation of new woodland (it does not cover the restocking of recently felled areas). Planting will be the usual method, although it will sometimes be possible to obtain natural regeneration by using seed dispersing naturally from adjacent woodland. The new woodland could be in the form of a completely new wood or be on land surrounded by an existing wood. For ‘general forestry practice’ refer to SN1. See SN3 for variations affecting ‘new native woodland’ and SN6 for ‘small woods’.

Ensuring the location is suitable

It is important to take account of the setting when planting a new wood or when planting open ground within existing woodland. Some proposals would cause adverse environmental, agricultural or other economic impacts not outweighed by potential benefits. Sometimes alternative planting strategies are possible. For example, several small woods positioned to give the appearance of woodland cover on a much larger scale may allow landscape improvement with less land-use change. The use of new woods to link existing woods can be beneficial both to wildlife and to the efficiency of woodland management. It is essential to assess the likely damage impacts from deer, rabbits (and at a later stage from grey squirrels) at the outset, and to plan accordingly. Risks of fire and vandalism may also have to be considered in some areas before finalising location and design.

Integration

- New woods offer new opportunities for recreation, especially near towns and in community woodlands. These uses of woodland need special consideration in forest design.
- Discussing proposals for new woodland with interest groups or representatives from the local community can help to identify ways in which proposals can be improved.
- Planting of some habitats is not permitted: see Appendix 2 – EU Directives. Other indications are given by local Biodiversity Action Plans, the DANI Statement on Environmental Policy (Northern Ireland) and other sources described in Appendix 2.
- Access adequate for planting operations may be different to that needed for later management. Weigh up any potential access needs and problems before making a final decision to plant.
- Take account of the deer, rabbit and squirrel strategies of local management groups and the potential impacts of the new woodland on these.
- The position and design of fences can be critical to successful integration. See SN1.



General forest design

Planting a new wood normally progresses as fast as resources become available and this can lead to uniformity of age class, sometimes over large areas. However, some diversity in structure can be achieved through good design of open areas, natural variation in site productivity and by varying species according to ground conditions. Further diversity of structure is primarily achieved by silvicultural practice and by changes imposed at the stage of felling and restocking (see SN4). The design must allow fulfilment of management objectives as defined after full consideration of the issues and alternatives. General design principles are as follows:

- Incorporate designated and protected sites sensitively in the design.
- Avoid fragmenting important semi-natural habitats and consider the effects on designed landscapes in the vicinity.
- Fit margins to the landform and tie them in with existing features such as streams and hedges.
- Position rides, roads and other features which create breaks in the tree cover so as to relate to the landform and allow space for the development of edge habitats. Special care may be required for the design of the edges of utility corridors and other essential routes, e.g. where river authorities need machine access to river banks and flood defences.
- Include areas for safe and effective control of deer wherever this is likely to be required in the future.
- Allow for 10–20% of open space within the area. Open space, including streams, ponds and well laid out roads and rides, should be used to encourage the development of wildlife habitat. More open space may be needed in some circumstances, e.g. when designing for high levels of recreation.
- Create additional open space in areas not naturally broken up by topographic features or natural woodland. This should be designed to develop permanent internal edges, structural diversity and greater flexibility in future management. These spaces should harmonise with the landform and site variation. The internal edges can be designed to define the shape of future felling coupes (which is especially important where the risk of windthrow will be high).
- Allow for the future impact of tree growth on planned open space, important views, designed landscapes, access routes and rights of way.
- Separate new planting of invasive species from existing semi-natural native woodland using a buffer zone. The zone should be designed to prevent direct dispersal of the seed of the invasive species into the semi-natural woodland.
- Follow the additional general design requirements described in FC Guideline Note 2 *Short Rotation Coppice in the Landscape* when planting short rotation coppice (for the production of biomass or energy).
- Consider how any existing and potential access and recreational use of the land can be managed.

Species selection

Select tree species from those which are suited to site conditions and objectives. [Guidance is available in the FC decision support system *Ecological Site Classification* – see Appendix 4]. Mixtures must be of species which are compatible under the proposed silvicultural system and sufficiently robust to withstand unforeseen changes, particularly delayed thinning, without failing to meet main objectives. The implications of different options then need to be considered according to the woodland setting. If timber production is one of the objectives, select mainly species capable of producing good quality timber on the site (and plant at densities not less than the forestry authorities recommend for that purpose). Consider investing in genetically improved stock to achieve increased yield and timber quality. New conifer woodlands should include broadleaved tree and shrub planting. Vary the conifer species to provide diversity in large areas (see SN1). Where native species are used, choose suitable local provenances if they are available (see FC Practice Note 8 *Using local stock for planting native trees and shrubs*).

- Most new woodlands are even-aged, having been planted over a short period of time. Any plan for eventual conversion to multi-age or continuous cover silviculture requires special attention to the choice of suitable species.
- Consider encouraging natural regeneration spreading from adjoining woodlands where this would meet objectives.
- The impacts of climate change on the environment are likely to affect species suitability for some sites in the medium to long term. Preliminary advice is available in FC Bulletin 125 *Climate change: impacts on UK forests*.

**STANDARD NOTE 3****CREATING 'NEW NATIVE WOODLAND'**

This Standard Note (SN) describes a category of new native woodland where the main objective is to develop a natural character using communities of locally native tree and shrub species matched to the site. FC Bulletin 112 *Creating new native woodlands* is the main source of detailed information. New woodlands of environmental and commercial value can also be created using native species within the wider scope of SN2 which gives general guidance about suitable location and design of new woodland.

New native woodland could be new planting or redevelopment of previously wooded land as a replacement to non-native woodland. It is intended that new native woodlands will supplement the area of semi-natural woodlands in the UK with habitats of similar type and value and so contribute to Habitat Action Plans for native woodlands.

Nature conservation and reinforcement of cultural landscapes will be primary objectives of management but these should not preclude management and use of new native woodland for other important benefits

Choosing a suitable site

These woodlands need to be sited with extra care if they are to fulfil their conservation purpose.

- Where possible, choose a site linked to sources of native woodland plants and animals, such as existing woodland or hedgerows. Expansion of existing semi-natural woods is preferred when such sites are available.
- Sites with semi-natural vegetation usually develop a natural character more quickly than others at a distance from natural sources of plants and animals. However, do not plant sites which have high conservation value as open habitat.
- Avoid close proximity to invasive sources of non native trees or make allowance by increasing woodland size.
- Try to make woods large and wide enough for a characteristic range of features to develop. New woods should ideally be at least 5 hectares in area and wide enough to prevent edge conditions dominating. Smaller sites can be valuable if linked to existing woods.

Design for development of a semi-natural ecosystem

Some design features need special emphasis to encourage a natural ecosystem to develop.

- The design of open ground is particularly important. Wherever possible it should be based on features of conservation potential and site diversity, including archaeological sites.
- Plan a network of open ground (which includes streams, ponds, roads and

rides) to occupy at least 20% of the area. [Over 20%, the distribution of the open ground has an impact on grant payable under the forestry/woodland grant schemes.]

- Link the network of open ground in the new woodland to adjoining open ground habitat.
- Plant external and internal edges irregularly and with decreasing planting density towards the edges, leaving room for natural colonisation to take place.
- Leave unplanted any areas which locally native trees are likely to colonise readily.

Use of natural colonisation and planting

New native woodlands provide a special opportunity to conserve the genes of locally native trees and shrubs. Expert advice may be required when choosing planting stock or judging the acceptability of an adjoining area as a seed source for natural colonisation (see FC Practice Note 8: *Using local stock for planting native trees and shrubs*).

Planting and natural regeneration

- Favour natural colonisation, thus reducing the need for planting. Colonisation is usually better for conserving local genetic material and achieves a more natural distribution and greater diversity.
- Base choice and spatial arrangement of species on locally native trees and shrubs adapted to the site, referring to the communities of locally native species described in the National Vegetation Classification (NVC) and FC Bulletin 112: *Creating new native woodlands*.
- Plants should be of local provenance and preferably from seed collected from semi-natural parent trees. Guidance on local provenance and seed collection is found in FC Practice Note 8 *Using local stock for planting native trees and shrubs*. In new native pinewoods the origin of planting stock should be from registered native pinewoods in the same genetic region as defined on the FC map (see FC Practice Guide: *The management of semi-natural woodlands – 7. native pinewoods* and Section 2 of the Scottish Forestry Grant Scheme applicant's booklet). Scots pine, beech, birch, alder, ash, gean, lime and oak are subject to EU Directives on Forest Reproductive Material which controls the use of material requiring information as to the parent material to be provided. Where there is insufficient supply of seed or plants then the FC or DARD may authorise the use of non-EU material.
- Only plant rare trees and shrubs after expert consideration of their natural distribution and genetic origin. Arrange for them to be recorded and monitored.
- Natural invasion by trees and shrubs which are not locally native may need to be controlled if they become a threat to development of the desired woodland type.
- Adjust the planting pattern to reflect the natural variation of conditions across the site.
- Always vary the planting density to produce a more diverse woodland structure than in normal plantations. The potential to produce timber of good quality can be improved by keeping the tree spacing close, with an irregular spacing between groups of trees. [N.B. low planting densities may affect payments under the forestry/woodland grant schemes.]



- Consider planting at closer spacing where dense weed growth is expected (e.g. on ex-arable land), reducing the number of trees to create structural diversity as soon as establishment has been achieved.

Site preparation and maintenance

Low impact methods should be adopted, particularly when planting semi-natural sites. Such methods tend to result in less uniform growth.

- Avoid intensive cultivation, ploughing and drainage. Irregular scarifying and mounding are acceptable.
- Some wet or rocky areas would be better not cultivated or planted.
- In general use fertilisers and herbicides only as spot applications around the trees and shrubs that need them. Exceptions may be appropriate when planting some derelict sites, ex-arable land and improved grassland. These may have heavy growth of competing vegetation of little conservation value.
- Respace and thin the trees to irregular patterns if a more even canopy structure develops than is typical of the equivalent semi-natural woodland type.
- Later maintenance should be similar to that for semi-natural woodland of equivalent type (see SN5), encouraging woodland structure which favours an irregular or continuous cover management system.

This Standard Note (SN) deals with all types of felling and restocking in woodlands other than ‘new native woodland’ (see SN3) and semi-natural woodland (see SN5). The latter also covers those old planted woods that have developed semi-natural characteristics of high conservation value. See also SN6 for possible modifications in small woods.

Felling and restocking plans

The timing of felling is usually influenced by financial or market considerations. However, advance planning is important in order to allow time for impacts on the rest of the forest and the surrounding countryside to be properly considered. An outline plan combining felling and restocking (ideally covering a period of at least 20 years) allows financial, environmental and access considerations to be addressed and integrated through forest design. Such plans are particularly desirable for large or complex woodlands and woods of high scenic, conservation or recreation value. The planning process should identify potential problems (which can then be minimised or avoided) and opportunities to increase the financial, environmental and social value of the woodland.

Planning felling and restocking: preparation of a forward plan

- Take account of the effect of land designations, important archaeological sites, protected habitats and species, water and other issues (see pages 19–23).
- Study the current and developing age and species structure of the woodland, and evaluate the opportunities provided by felling and restocking to increase diversity.
- Decide whether continuous cover or other irregular silvicultural systems are preferable to clearfelling in some parts of the area.
- Identify features of the internal and external landscape in need of improvement.
- Take stock of timber and other forest products and services, and the likely costs and benefits of early and delayed felling.
- Appraise the effect of alternative felling systems and felling boundaries on cost, profit and environmental impact.
- Appraise the effect of different felling systems and boundaries on restocking costs, including the implications for planting, natural regeneration and protection.
- Identify and take due account of social and recreational impacts both within the woodland itself and in the surrounding countryside.
- Where appropriate, hold discussions with the local community and interest groups.

Broadleaved woodland (including mixed woodland which is mainly broadleaved at maturity)

In order to conserve broadleaved woodland area in the UK there is a strong presumption that when broadleaved (or mainly broadleaved) woodland is felled the regenerated woodland will also be broadleaved (or mainly broadleaved). This



does not preclude the use of initial mixtures with conifers except in semi-natural woodland. These can improve cash flow and timber yield.

Shelterwood systems, group felling and sequential coppicing are alternatives to clearfelling and can produce environmental benefits. Plans for felling should be fully co-ordinated with a regeneration plan (coppice, planting and/or natural regeneration).

Broadleaved woodland: felling and restocking

- The design principles for regenerated woodland are no less than those for new woodland. See SN1 and SN2 to see where improvement is required.
- If using a clearfelling system, avoid complete clearance by felling and aim to regenerate part (or parts) to thicket stage before an adjoining part is felled. The number and location of parts felled within any age class will depend on the chosen system of felling and regeneration as well as on landscape and management considerations.
- In large woods it is desirable to develop several distinct age classes. These may differ in size and distribution. In even aged woods – up to 20 hectares – at least two age classes should be developed with as wide an age gap as possible.
- Retain some of the area to increase the structural and ecological diversity of the woodland by producing dead boughs and large fallen wood. These are of particular value in ecosystem development. The location of retentions in the wood may need careful landscape consideration and will not be appropriate in association with every felled area. If managing by a continuous cover system a few individuals or groups can be grown to this stage throughout the area.
- Retain individuals or groups of very old or veteran trees and pollards, selecting locations to avoid creating an unreasonable safety risk. Very old trees have particular ecological and cultural value. Some may need individual attention by localised thinning, or pollarding.
- Native species and areas of semi-natural woodland are normally preferred for retentions (see SN5 for appropriate management).

Conifer woodland (including mixed woodland which is mainly conifer at maturity)

In many long established conifer woodlands, past management has encouraged the use of a variety of species. Forest structure can also be diverse as a result of thinning and felling taking place at different times. Networks of roads, rides and glades often provide enough open space to meet current requirements. Nevertheless, improving the structure of such woods may still be possible over time and positive action may be required to avoid unnecessary clearance of standing and fallen dead trees during operations. The main concern should be to retain as much as possible of existing diversity while maintaining or increasing productivity. Possible changes include restocking conifer areas with a greater variety of conifers, a conifer–broadleaved mixture, or broadleaved woodland.

Other less diverse woodlands, particularly many of the areas afforested with conifers in the latter half of the 20th century, have been planted with a more limited range of species, often only one or two. Few have developed structural diversity and positive action is required, especially on poor soil in upland areas, if they are to do so. In these cases the felling and restocking stage provides an important opportunity to begin to improve forest design and increase diversity. In wet and exposed uplands the process of adequately developing structural diversity in large forests may take more than one felling cycle. Consequently good forward planning is essential, including liaison with managers of adjoining forest, so that the opportunities to re-design the forest can be realised over time.

It may be possible to introduce group felling or a continuous cover system of silviculture (with or without the use of natural regeneration) on lowland and less exposed upland sites with well-drained soils. In such situations these methods can be a good alternative to clearfelling as long as:

- they can still meet an owner's need for cash flow;
- the owner is able to provide the more intensive supervision required to guarantee successful restocking;
- the forest design takes account of any need for landscape and ecological improvement. As with clearfelling, the systems should allow for the retention of some groups or individual trees well beyond normal felling age.

Conifer woodland: felling and restocking

- The design principles for the regenerated forest are no less than those for new woodlands. Avoid repeating current design problems. See SN1 and SN2 to see where improvement is required.
- Identify future felling and replanting/natural regeneration boundaries at the earliest planning opportunity. Where possible, crop edges should be managed to increase stability and to improve their future appearance when fully exposed.
- Identify areas which are, or will be, managed under a continuous cover system and build them into the forest design.
- Design improvements to the network of open ground, streams, broadleaved woodland and semi-natural habitats.
- Increase structural diversity by felling parts of an even-aged woodland at different times (though not necessarily in equal areas).
- Current recommendations for the minimum interval between felling of adjacent areas are 8–15 years in the uplands and 7–15 years in the lowlands. In practice they both depend on the height growth of replacement crops for their effect, and on the crop stability and financial impacts of advancing and delaying felling. For planning purposes the interval can be taken as 7 years, while in practice adjoining crops should not be felled before the restocking of the first has reached an average height of at least 2 metres.
- Avoid felling larger areas than are required for reasonable economy of scale taking opportunities to increase felling age diversity within large even-aged areas of forests. Wherever possible, the boundary of the felling should be at a stable edge.



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- The shape and scale of felling areas should be appropriate to the landform. However, high windthrow risk or extensive areas of existing windthrow may make it essential to fell very large areas in one go at the end of the first rotation.
- Where felling areas exceed 30 hectares in lowlands and 100 hectares in uplands, introduce more diversity than indicated in SN1 by further increasing the proportion of broadleaved woodland, and/or open space and/or variety of conifer species.
- Design the position of future windfirm edges within the regenerated area to allow flexibility in the management of future felling.
- Identify suitable, stable areas of the forest where trees can be retained for the long term (with or without further thinning) to provide an extended conifer woodland ecosystem by the formation of the dead branches and large fallen wood characteristic of natural forests. Aim to retain 1% of the area where stands are reasonably stable. Where managing by a continuous cover system a few individuals or groups can be grown to this stage throughout the area.
- Existing veteran trees should be retained unless they are creating an unreasonable safety risk.

MANAGING SEMI-NATURAL WOODLAND

STANDARD NOTE 5

This Standard Note (SN) applies to the following categories of semi-natural woodland:

- Semi-natural woodland as described in the FC Practice Guides *The management of semi-natural woodlands (1–8)*. This category includes ancient semi-natural woodlands (ASNW), which are of special value.
- Old planted woods (or parts of them) that have developed a similar species and composition to semi-natural woodland and have high conservation value.
- Some ancient woodland sites now bearing non-native plantations but which still have significant features of semi-natural woodland. In such cases this SN applies where restoration is an objective of management (See FC Practice Guide *Restoration of native woodland on ancient woodland sites*).

This SN modifies some of the general forestry practice described in SN1. SN3 deals with the creation of new native woodland (and the expansion of semi-natural woodland).

National aims for semi-natural woodlands are to:

- maintain and restore natural ecological diversity;
- maintain and improve aesthetic value;
- maintain genetic integrity of populations of native species, so far as is practicable;
- take opportunities to produce utilisable wood;
- enlarge the woods where possible (as described in SN3).

Wherever possible these aims will be met while respecting the objectives of individual owners, the distinctive cultural characteristics of individual woods, and the needs of the community. The UK Biodiversity Action Plan has developed specific programmes and targets aimed at achieving conservation of semi-natural woodlands. These are reflected in policy instruments and guidance.

Management plans

Management plans for semi-natural woodland usually require qualitative and quantitative information on habitats and wildlife. Provision for long-term monitoring of the effects of conservation and other management is usually greater than is required for a plantation woodland. It is important to recognise ecological processes and how they will be affected by planned changes. Many owners and foresters find the work particularly interesting and rewarding. Knowledgeable help with survey, evaluation and monitoring is often available locally.

A management plan should be prepared for individual woods or groups of small woods. The following plan structure is recommended to ensure necessary aspects are covered: description; evaluation; objectives; long-term strategy; silvicultural systems; operational methods and monitoring.



Management plans for semi-natural woodlands

- Maintain the semi-natural type by using natural regeneration wherever practicable, or planting stock of locally native species adapted to the site.
- Maintain or enhance the natural diversity of species, woodland structure and habitats.
- Maintain some mature habitats and moderate the rate of change to allow species to adjust.
- Ensure strategies to meet other objectives, such as timber production and recreation, are compatible with ecological (and any statutory) requirements.
- Use operational methods which avoid excessive disturbance to the site.
- Set up a mechanism for monitoring the results of management and how successful it is at meeting the objectives and developing the key features of the wood.

Management planning

The FC has classified semi-natural woodlands into eight types and these are described in the Practice Guides *The management of semi-natural woodlands (1–8)*. Each wood should be individually evaluated against these descriptions to decide the management required. There is usually a variety of acceptable approaches.

Main management systems

- Minimum intervention: appropriate to nature reserves and remote or inaccessible locations without a prolonged history of active management, and to small areas in large intensively managed woods which serve as refuge for species intolerant of disturbance.
- High Forest: appropriate for most woods without a recent history as active coppice, where management is possible by a variety of shelterwood and group and small-scale felling systems.
- Coppice/Coppice with Standards: for woods with a recent coppice history (in general, those cut at least once within the past 40 years).
- Wood pasture: where in current use (or where there is a realistic chance of restoring the grazing regime), traditional wood pasture systems should be continued and adapted to maintain their conservation and cultural values.

Woodland design

The woodland area should be surveyed and divided into management units based on variation in site, vegetation and stand characteristics. Within each management unit, conservation programmes can then be developed.

Woodland design – some special elements for many semi-natural woodlands

- Preserve cultural boundaries and features such as ancient rides and banks.
- Identify minimum intervention areas varying in size and proportion from clumps in small woods to areas of tens of hectares in large woods.

- Consider the need for regeneration. To preserve or improve structural diversity, 10–25% is the maximum proportion of the woodland which should normally be under regeneration at any time.
- Retain some old, dying or dead trees in regeneration areas where it is reasonably safe to do so. If possible, include representatives of each of the native tree species found in the wood.
- Permanent and temporary open space is a natural feature of most semi-natural woodlands and its management should be part of the plan. In some cases maintaining open space will require positive management.
- When restoring or extending open areas they should be based on riparian or other wetlands, rock outcrops, parts of the ride network, landscape or cultural features, and cover the range of soil types present.

Changes to the area of woodland

The area occupied by semi-natural woodland should not be reduced.

Expanding or linking small woods to others (by creating new native woodland) is usually very desirable and might take higher priority than regeneration within the wood.

Where necessary, external margins can sometimes be improved by extension as new native woodland onto open ground. However, as some open ground is valuable in itself as habitat or open landscape, the potential impacts of woodland expansion must be carefully assessed.

The use of natural regeneration and planting

In semi-natural woodland, natural regeneration or colonisation is strongly preferred to planting because it is better able to maintain the diversity of structure, composition and genotype. Where natural regeneration can reasonably be expected, planting should be delayed long enough to allow for at least one good seed year after grazing has been controlled. Exceptions where planting would be favoured occur where:

- enrichment of a species is required to meet agreed wood production objectives;
- a species which is characteristic of the woodland type is not sufficiently represented, or is unable to regenerate adequately owing to current site conditions;
- natural regeneration is likely to be predominantly of non-native species.

Species which are not native to the local site-type should not be planted if they are not already present in semi-natural woodland. In some circumstances non-native species which are already present may be retained to some extent in the regeneration. FC Practice Guides *The Management of semi-natural woodlands (1–8)* describe these circumstances in more detail for each semi-natural woodland type. See also the paragraph below about thinning and removal of non-native species.



In planted ancient woods still showing significant semi-natural features the case for using natural regeneration on genetic conservation grounds will usually be less strong. Planting can be used, selecting species and genetic origin according to circumstances and objectives.

Grazing and browsing

Maintaining low to moderate densities of wild and/or domestic herbivores is usually desirable for maintaining the ecological diversity of semi-natural woodland. However, the most practical short-term method of securing regeneration and protecting coppice shoots is often to combine wildlife control with the complete exclusion of browsing animals by fencing (or for small areas, by using various methods of group or individual tree protection). In the longer term, wildlife management and control may be more efficient than fencing and avoids some of the problems caused by fences, especially deer fences. In native pinewoods, special attention to fence design and minimising fence use is important to reduce deaths of woodland grouse.

Species and genetic origin of planting stock

When choosing native planting stock it should be either:

- locally native species present in the wood; or
- locally native species now absent in the wood but believed to have been eliminated in recent times (e.g. by stock grazing).

Plants should be of local provenance and preferably from seed collected from semi-natural parent trees (see FC Practice Note 8 *Using local stock for planting native trees and shrubs*). Scots pine, beech, birch, alder, ash, gean, lime and oak are subject to EU Directives on Forest Reproductive Material which controls the use of material requiring information as to the parent material to be provided. Where there is insufficient supply of seed or plants then the FC or DARD may authorise the use of non-EU material.

Planting practice in semi-natural woodlands

- Choose tree and shrub species carefully by following variations in soil, landform and vegetation.
- Plant in an irregular pattern influenced by minor variations and irregularities in the site.
- Vary the spacing. Where the production of quality timber is a desired objective, the average spacing should be 2.1 metres or closer, but with gaps or wider spacing between groups to create a varied woodland structure.
- Wider average spacing could be adopted if timber production is not expected to be of significance to objectives, or where natural regeneration will be sufficient to supplement the planting and encourage good stem form. [Stocking rates of fewer than 1 100 trees per hectare, planted or regenerated, would be unlikely to receive forestry grant aid.]

Thinning and the removal of non-native species

Thinning can be used to vary the structure of the woodland according to its semi-natural type. It can also be used to remove non-native species. Where timber production is a management objective thinning is encouraged, subject to any overriding conservation consideration, in order to promote the production of good quality timber.

- Retain representatives of all the species of native trees and shrubs present.
- Use variation of thinning intensity to maintain varied conditions and to encourage an understorey and shrub layer in more mature stands.
- Complete removal of existing non-native trees and shrubs is appropriate where they are invasive and likely to displace native species. However, where a large portion of the woodland is already composed of non-native species, gradual reduction and control may be more suitable.
- Use low impact methods for timber harvesting and avoid excessive disturbance and compaction. Small-scale working should be the norm.

Minimising adverse impacts of all necessary operations

Semi-natural woodlands are particularly vulnerable to disturbance. This may restrict the scale of operation and choice of working methods compared with those used in other types of woodland. Drainage of semi-natural sites is rarely appropriate. This and other operations should be timed to avoid critical flowering and breeding times identified in the management plan.

**STANDARD NOTE 6****PLANTING AND MANAGING SMALL WOODS**

This Standard Note (SN) describes the special considerations for woods ranging in size from little more than a clump of trees up to about 5 hectares in the lowlands and 10 hectares in the uplands. The SN is also relevant to long, narrow woods such as shelterbelts, waterside woodlands and the spurs of larger woodlands where edge is long in proportion to area. This SN should be read in conjunction with SN2 which describes the process of ensuring suitable location and design of new woods. Where the small wood is (or is close to) a new native woodland or semi-natural woodland, reference must also be made to SN3 and SN5.

Choosing a suitable site

The creation and management of small woodlands can have an effect on the landscape and wildlife out of all proportion to their size. There are several ways in which anyone planning to create a new small wood can secure a variety of benefits and avoid any adverse environmental impacts.

- Link new woodlands to other new or existing woodlands, and to landscape and wildlife habitat features such as hedgerows and watercourses. Linking with other woodlands or access routes can be valuable in the development of countryside recreation.
- Keep in harmony with the character of the countryside especially in strong cultural (traditional) landscapes. New woodland may not be appropriate in some relatively treeless landscapes.
- Protect archaeological and historic features, and strengthen rather than disrupt historic designed landscapes (see FC Practice Advice Note *Woodlands in designed landscapes*).
- Design the woodland so that it is sympathetic to landform – especially in hilly areas.
- When siting new community woodlands, give preference to sites with safe access that are within easy walking distance of where the people will come from.
- When planting new woods, ensure there will be access for future forest operations, including timber removal.

Design and planting**Planting design**

- Choose species which are suited to the site and to the intended objectives for the woodland. Choice may be restricted on derelict or reclaimed sites.
- Make later management easier by adopting a simple planting design and avoiding complex species mixtures.
- Where suitable, choose native species and provenances of broadleaves in preference to non-natives. They will generally yield greater ecological benefit.
- In situations vulnerable to grey squirrel damage, include some species which are fairly resistant.

- Provide diversity and greater flexibility for future management by using species which grow and mature at different rates in different parts of the woodland or by using species which are suitable for a continuous cover or coppice system.
- For the edges of the wood, choose tree and shrub species which will develop irregular woodland edge habitat, allowing sufficient room to avoid overshadowing by the main tree crop.
- There is generally little ecological need for open space within small woodlands, but allow room for woodland field layer vegetation to develop at the edges.
- In woodlands with recreational access, particularly community woodlands, internal design is also important.
- Careful design can reduce the area which needs to be closed during hazardous operations.

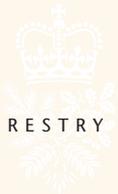
Later management and regeneration

Most woodlands require management to avoid the long-term decline which can ultimately threaten their survival. Protecting a woodland from heavy grazing is essential if any regeneration is to succeed. Felling and regeneration operations are usually necessary although sometimes owners are discouraged by the cost of small-scale working and concerns about landscape impact. Management strategies should therefore aim to produce a productive asset but also to reduce the potential environmental impact of felling. Liaison and co-operation with other woodland owners in the vicinity can help to reduce costs incurred in pest control and the organisation of contractors, and to increase the revenue from timber sales.

Long-term management strategies for small woodlands

- Ongoing protection from mammal damage must be assured (see SN1).
- Thinning or respacing encourages later management because it increases the value of the timber.
- Adopting a coppice or continuous cover system may avoid the need for clearfelling, particularly in broadleaved woodlands. In even-aged woodland, suitable action needs to be planned and implemented before trees reach normal felling age.
- The impact of clearfelling can be reduced if selected parts of the wood have been developed as groups suitable for long-term retention.
- The impacts of clearfelling may be reduced by plans or agreements about the treatment of nearby woods. Some woods can be managed to maintain the general character of the landscape and local biodiversity until the felled and regenerated woods are again a significant feature.
- Plan well ahead for the regeneration of successful shelterbelts and woods planted as screens because they will no longer be so efficient once they become over-mature.

A proposal to fell and not restock a badly-sited wood should be tested against alternatives such as improving the shape and size, or planting a more suitable site. There should be proper provision for environmentally acceptable after-use of the felled site.



THE HELSINKI GUIDELINES (1993)

APPENDIX 1

RESOLUTION 1:

General Guidelines for the Sustainable Management of Forests in Europe

- 1 Human actions must be avoided which lead, directly or indirectly, to irreversible degradation of forest soils and sites, the flora and fauna they support and the services they provide. Efforts should be increased to keep the emissions of air pollutants and greenhouse gases below the expected tolerance level of forest ecosystems, taking into account the long-term cumulative and/or synergistic effects of pollutants. Forest fires and the pollution of soils must be strictly controlled and could dictate overall policy and management objectives and practices in particularly sensitive parts of Europe.
- 2 Forestry policies, as adapted to local laws within the framework of national traditions and constitutional processes, should recognise the long-term nature of forestry by having an appropriate level of continuity in legal, institutional and operational matters and should strongly encourage practices in state and private forests which facilitate multiple functions and sustainable management, including the conservation and appropriate enhancement of biodiversity. Forest owners who provide multiple use benefits to the community should be encouraged and supported by society or other beneficiaries, as appropriate, when such provision involves them in excessive costs.
- 3 Forest management should be based on stable and long-term land-use policies and regulations, which, *inter alia*, are aimed at conserving functional forest ecosystems, and take account of the ownership structure in Europe, and which are based on the general presumption that forest land, particularly land considered natural or semi-natural, will remain dedicated to that use.
- 4 Forest management should be based on periodically updated plans or programmes at local, regional or national levels, as well as for ownership units, when appropriate, and on forest surveys, assessments of ecological impact, and on scientific knowledge and practical experience.
- 5 Forest management should provide, to the extent that is economically and environmentally sound to do so, optimal combinations of goods and services to nations and to local populations. Multiple use forestry should be promoted to achieve an appropriate balance between the various needs of society.
- 6 Forest management practices should have due regard to the protection of areas of ecological fragility, to the conservation of primary and climax forests, areas with cultural heritage, and the landscape, to safeguarding the quality and quantity of water, and to maintaining and developing other protective functions of forests such as the protection of aquatic and agricultural ecosystems and protection against floods, erosion and avalanches.

- 7 Forest management practices should aim at maintaining and, if possible, improving the stability, vitality, regenerative capacity, resistance and adaptive capacity of forest ecosystems towards stresses, including their protection against fire, pests, diseases, game and other agents of damage such as overgrazing and unregulated browsing. The prevention and control of large-scaled biotic and abiotic damage should be supported. Special attention should be paid to maintaining and, if needed, to improving the quality of forest soils. Silvicultural practices emulating nature should be encouraged. Practices contrary to sustainable management should be actively discouraged.
- 8 In the management of existing forests and the development of new forests, the chosen tree species should be well suited to local conditions and be capable of tolerating climatic and other stresses such as insects and diseases, and potential climate changes, throughout the growing period. Genetic selection, which is commonly practised in Europe, should not favour performance traits at the expense of adaptive ones except in particular cultures where intensive care may protect them against damage. Afforestation should be conducted in a manner that does not negatively affect ecologically interesting or noteworthy sites and landscapes.
- 9 Native species and local provenances should be preferred where appropriate. The use of species, provenances, varieties or ecotypes outside their natural range should be discouraged where their introduction would endanger important/valuable indigenous ecosystems, flora and fauna. Introduced species may be used when their potential negative impacts have been assessed and evaluated over sufficient time, and where they provide more benefits than do indigenous ones in terms of wood production and other functions. Whenever introduced species are used to replace local ecosystems, sufficient action should be taken at the same time to conserve native flora and fauna.
- 10 Due to the high level of human consumption and waste common in many areas of Europe, recycling and use for energy of forest products should be encouraged both to alleviate the problem of waste disposal and to increase the potential of forest products to substitute for products from non-renewable sources.
- 11 Because of the expanding European forest resource, the use of wood and non-wood forest products should be encouraged on a basis compatible with the sustainable management of forests, thereby providing and increasing the potential for traditional and new forest products, sales of which can provide, for both the owner and society, a ready means of financing forest management.
- 12 As knowledge, skills and public opinion will affect forestry policies in Europe, public awareness and understanding of sustainable management should be promoted, and the provision, through appropriate research, of information and training to forestry practitioners and forest owners on the concept and on methods of implementing it should be intensified. To ensure the sustainable management of forests, a sufficient number of adequately trained and competent staff are essential.

RESOLUTION 2:

General Guidelines for the Conservation of the Biodiversity of European Forests

- 1 The conservation and appropriate enhancement of biodiversity should be an essential operational element in sustainable forest management and should be adequately addressed, together with other objectives set for forests, in forestry policies and legislation.
- 2 The conservation and appropriate enhancement of biodiversity in forests should be based both on specific, practical, cost-effective and efficient biodiversity appraisal systems, and on methods for evaluating the impact on biodiversity of chosen forest development and management techniques.
- 3 Where possible, the size and degree of utilisation of forest compartments and other basic management units should take account of the scale of variation of the site, in order to better conserve and manage the diversity of habitats. Management should aim at increasing the diversity of forest habitats.
- 4 Where possible, the establishment of taxa which are naturally associated with those that occur most frequently in the forest should be encouraged, and a variety of structure within stands should be favoured where the natural dynamics of such associations permit.

NATURE CONSERVATION

EU Birds Directive and EU Habitats and Species Directive

- require that habitats and species which are rare or endangered at EU level are maintained at favourable conservation status through designating land as Special Protection Areas (SPA) or Special Areas of Conservation (SAC), and implementing conservation measures for these species and habitats on undesignated land. Collectively, the series of designated sites is known as Natura 2000. Any forestry or other activity within, or likely to affect, Natura 2000 sites must be undertaken in ways which do not damage their value for the designated habitat or species, and only after consultation with the statutory conservation organisation. There are circumstances where the EU directives have an overriding authority to affect forestry proposals in undesignated areas especially where the ‘priority’ habitats or species are found. Examples of priority habitats are: Caledonian Pinewoods; some other categories of semi-natural woodland; active blanket bogs and active raised bogs. Undesignated areas, can be important, particularly for wide ranging species listed in the Directives, such as bats. Advice on the Directives is available from the statutory conservation agencies, the Forestry Commission or the Forest Service of the Department of Agriculture and Rural Development.

National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) in GB and Areas of Special Scientific Interest (ASSI) in Northern Ireland

- offer protection to habitats and species. Some sites are also designated as Natura 2000 sites. In addition to wildlife sites, some are designated for their geological or geomorphic interest. ‘Ramsar’ sites are wetland areas of international importance and in UK are designated as SSSIs or ASSIs. Protection for SSSIs in England and Wales was strengthened by the CROW Act 2000 (see below).

Wildlife and Countryside Act 1981 (as amended) and the Wildlife (Northern Ireland) Order 1985

- offers protection to many specified plants and animals, as well as broad protection to unspecified plants and animals such as nesting birds. The degree of protection varies, but is not confined to rare species. The Wildlife and Countryside (Amendment) Act 1985 amended the Forestry Act 1967. It required the Forestry Commissioners to endeavour to achieve a reasonable balance between afforestation, timber production, the conservation and enhancement of natural beauty, and the conservation of flora, fauna and geological and physiographical features of special interest.

UK Biodiversity Action Plan

- sets out a programme of action to conserve and enhance biological diversity throughout the UK. It includes the development of Habitat Action Plans (HAPs) and Species Action Plans (SAPs) for priority habitats and species, and

cross-sectoral programmes to encourage biodiversity conservation within all land-uses and business activities. Local Biodiversity Action Plans integrate these measures at local or regional level. The emphasis is on agreeing targets for joint action by public bodies, business, landowners and environmental organisations. Forestry is expected to contribute through helping to deliver habitat and species action plans (especially native woodland plans), wider diversification measures in woodlands, avoiding planting on valuable open habitats and restoring some which have been planted in the past.

Countryside and Rights of Way Act 2000 (England and Wales) (CROW)

placed a duty on government ministers and departments and the National Assembly Government for Wales to have regard to the purpose of the conservation of biodiversity in the exercise of their functions. This relates explicitly to obligations under the Convention on Biological Diversity. The CROW Act requires the publication of official lists of priority habitats and species in England and Wales and the promotion of action.

CULTURAL AND LANDSCAPE HERITAGE

Scheduled Ancient Monuments (SAM) – and their settings

- are legally protected from damaging operations.

Register of Parks and Gardens of Special Historic Interest in England and the Inventory of Gardens and Designed Landscapes in Scotland

- record many valuable designed landscapes.

Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales

- records many valued aspects of the Welsh landscape.

National Parks

- have been designated to conserve beauty, wildlife and heritage and to promote public enjoyment of their special qualities. Any change in land-use or activity which might affect their character and heritage value is subject to close scrutiny by the park authorities.

National Scenic Areas (NSA)

- in Scotland are designated as the best examples of a type of natural beauty popularly associated with Scotland. Special arrangements apply to consultation over forestry proposals.

Areas of Outstanding Natural Beauty (AONB) and Heritage Coasts

- are designated in England, Wales and Northern Ireland for their high landscape value. This may affect the management of existing woodlands and the possibility of creating new ones.

PUBLICLY REGISTERED RIGHTS

Public Rights of Way

- are recorded in England and Wales on Definitive Maps held by local

authorities. The record shows whether the Right of Way is by foot, horse or vehicle. (In Scotland local authorities hold informative maps which may be a basis for action to assert rights of way.)

- the Countryside and Rights of Way Act 2000 amended the law relating to public rights of way in England and Wales and makes new provision for access to the countryside.

Rights of Common

- have been legally registered with local authorities in England and Wales. Where the common rights can be exercised on private land, the landowner is likely to be aware of it through registration process.

LOCAL AUTHORITY ORDERS AND DESIGNATIONS

Tree Preservation Orders (TPOs)

- may be made on individual trees and areas of woodland by planning authorities. In England and Wales the Forestry Commission will make the decision about whether to grant a felling licence when required in consultation with the local authority. In other cases local authority consent will be required. In Scotland all such cases are referred to the local authority for a decision.

Conservation Areas

- may affect trees and woodlands falling within a larger area. Restrictions are similar to those of a TPO.

Planning Authority Designations

- are sometimes applied to areas and features of local significance so that their special importance is recognised in local planning and conservation issues. Areas such as local nature reserves are usually mapped in Local Plans which can be particularly helpful as an indication of special environmental features and community interests.

INDICATIVE INFORMATION

Government and local authority information sometimes indicates a strong presumption for or against some types of afforestation and woodland management. This is usually quickly reflected in published guidance, grant decisions and felling controls. Examples are the policies for protection of prime agricultural land and specially identified areas of hill sheep land (in Scotland), the policy against the further afforestation of deep peat in Northern Ireland (DARD), and FC guidance on the protection and restoration of active blanket and raised bogs in GB.

Other information can be less direct in its influence on decision making. For example: English Nature, the Countryside Commission and English Heritage have co-operated to map England into areas of distinctive character ('The Character of England' map) and Scottish Natural Heritage are preparing landscape character assessments in Scotland. Reports on the historic character of the landscape have been produced for parts of England and Scotland. A Register

of landscapes of Special Historic Interest has been produced for Wales. The maps and surveys help to identify distinctive and valuable heritage characteristics as well as highlighting impoverished landscapes.

Local Authority Structure Plans (England and Scotland), Unitary Development Plans (Wales and Metropolitan Boroughs) and Local Area Plans (NI), and Community Strategies in Wales are further sources of information on local issues and preferences, some of which may affect woodland. In most counties or districts non-statutory sites of nature conservation value will also have been identified by local authorities, conservation agencies and voluntary wildlife groups. Owners will generally be aware of these sites, the existence of which should be taken into account during the planning of forestry proposals.

Indicative Forestry Strategies or Local Forestry Frameworks have been produced by some local authorities. These broadly classify areas according to their likely sensitivity, potential for afforestation or types of woodland that may be most suitable.

Plans have been drawn up by each of the Community Forests in England and by similar initiatives in Wales and Scotland. These provide an important framework for guidance and encouragement of woodland planting and management in those areas.

Registers of ancient and semi-natural woodland have been prepared by the nature conservation agencies. The registers help to identify woodland where special consideration should be given to the conservation of semi-natural habitat.

**APPENDIX 3****GLOSSARY TO THE UK FORESTRY STANDARD**

The brief descriptions in this Glossary may only be sufficient for the context in which a term is used in this Standard. Refer also to Appendix 2 for the titles and acronyms of systems of formal designation affecting the countryside and their descriptions.

Access (public)

Refers to woodland and its associated land open to the public for recreational or educational use (sometimes subject to charges). Does not detract from any legal rights.

AFAG

Agriculture and Forestry Advisory Group, an advisory group working for the Agricultural Industry Advisory Committee (AIAC) of the Health and Safety Commission.

Ancient woodland

A classification for woodland which has been in continuous existence from before AD 1600 in England, Wales and Northern Ireland, and from before AD 1750 in Scotland.

Approvals: herbicide or pesticide

Products, their usage and methods of application approved by UK Pesticides Safety Directorate.

Biodiversity

The variety of ecosystems and living organisms (species), including genetic variation within species.

Biodiversity Action Plan

The UK plan setting proposals and targets for conserving and enhancing biodiversity.

Broadleaves

Broadleaved trees and woodlands. In the UK most have laminar leaves. Although often referred to as 'hardwoods' not all produce hardwood timber. In UK most are deciduous.

Buffer zone

An area of non-invasive trees or other land-use of sufficient width to protect a semi-natural woodland from significant invasion by seed from a nearby non-native source.

Colonisation

Natural regeneration (of trees) on previously unwooded sites.

Community woodland

Local woodlands for people to enjoy, where the needs and wishes of local people are important in planning and management.

Compartment

A distinct sub-division of the woodland suitable as a basis for long-term management and record keeping.

Conifers

Coniferous trees and woodlands. In the UK, conifer trees all have needles or scale-like leaves. With the exception of larches all are evergreen. Sometimes referred to as 'softwoods' because (along with some broadleaved trees) they produce softwood timber.

Conservancies

The FC areas for administration below country level.

Conservation agencies

The statutory nature conservation agencies: the Department of the Environment (Northern Ireland) and the statutory agencies in GB: English Nature, Scottish Natural Heritage and the Countryside Council for Wales.

Continuous cover

Silvicultural systems whereby the forest canopy is maintained at one or more levels without clearfelling.

Coppice system

Management based on regeneration by regrowth from cut stumps (coppice stools). The same stool is used through several cycles of cutting and regrowth.

Coppice with standards

Coppice with a scatter of trees of seedling or coppice origin, grown on a long rotation to produce larger sized timber and to regenerate new seedlings to replace worn out stools. (Compare with Shelterwood, see below.)

Countryside character (map)

A zonation of the countryside by its natural and cultural characteristics.

Cultivation

Any method of soil disturbance to aid the establishment of trees.

Cultural boundaries

Boundaries of territory or units of specific land-use such as banks, walls and ditches. Some of these features may date back hundreds of years.

Cultural features

Archaeological sites, historic buildings and heritage landscapes including ancient woodlands.

Cultural landscape

An area of countryside whose character is predominantly the result of the patterns of human activity, often built up over long periods of time.

DARD

Department of Agriculture and Rural Development for Northern Ireland, the parent government department of the Forest Service.

Derogation from Forest Reproductive Material Regulations

An exception made under the regulations which may be obtained under certain circumstances by the FC or Forest Service.

Designed landscape

A pleasure ground, park or large garden laid out with the primary purpose of creating an aesthetically pleasing scene or sequence of vistas.

Development

Change of land-use from forestry or agriculture authorised by the planning authorities, usually for building and urbanisation.

Drainage

An operation to remove excess water from an area in a controlled way. In woodlands, drains are almost always open, unlined channels.

Ecosystem

The interaction of communities of plants and animals (including humans) with

each other and the non-living environment. Balanced ecosystems are stable when considered over the long term (hundreds of years in the case of woodland).

Environmental Impact Assessment (EIA)

Procedure to require assessment of potential environmental impacts that may be initiated under Directive of the Council of Europe No 85/337 - SI 1988 No 1207 and revised with SI 1998 No 1731. The 1985 EU Directive was revised under No 97/11 - SI 1999 No 2228 and SI 1999 No 43.

Environmental Statement

Statement required where an Environmental Impact Assessment is called for.

Establishment (period)

The formative period which ends after young trees are of sufficient size so that, given adequate protection, they are likely to survive at the required stocking.

EU Birds Directive

European Union Directive for the protection of rare or endangered bird habitats and species. Requires designation of Special Protection Areas (SPA).

EU Habitats and Species Directive

European Union law requiring protection of habitats and species which are rare or endangered across the EU. Requires designations of Special Areas of Conservation (SAC) and Special Protection Areas (SPA), and other measures.

Felling (clear)

Cutting down of an area of woodland (typically greater than 0.25 hectares if within a larger area of woodland). Sometimes a scatter or clumps of trees may be left standing within the felled area.

Felling (group)

As clearfelling, but in smaller areas (typically less than 0.25 hectares) where microclimate is strongly influenced by the remaining woodland.

Forest

See forestry. Note that *forest* is a term which can have quite different meanings in other legal and land-use contexts.

Forest Design Plan

Long-term outline design plan (20 years or more) used by Forest Enterprise. The first few years of planting, felling, regeneration and environmental management plans are shown in detail.

Forest Enterprise (FE)

Agency of the FC in England, Scotland and Wales, responsible for managing its woodlands.

Forest Plan

Mechanism for FC approval of thinning and felling for a 10 year period on private estates.

Forest Service

An executive Agency of DARD responsible for the regulation of forestry and the management of state forests in Northern Ireland.

Forest values

The marketable (cash) resource and the environmental and social benefits, such as landscape enrichment and conservation. The environmental and social benefits are difficult to quantify in cash terms.

Forestry

The management of predominantly tree covered land (woodland) whether in large tracts (generally called forests) or smaller units (known by a variety of terms such as woods, copses and shelterbelts).

Forestry authorities

The FC and DARD. (Other bodies also have roles in regulating forestry in particular circumstances.)

Forestry Commission (FC)

Government department responsible for implementing forestry policy and regulations in England, Scotland and Wales.

Forestry practice

The techniques used in forestry planning and forest operations to produce all types of forest benefit.

Glade

A small area of open ground which forms an integral part of a woodland.

Great Britain

England, Scotland and Wales.

Heritage agencies

The statutory bodies: Historic Scotland, English Heritage and Cadw.

High Forest

Woodland comprising trees grown from plants, cuttings or seedlings (as opposed to coppice). In practice, broadleaved High Forest often includes trees of coppice origin.

Local authority

Local government planning authority.

Local Biodiversity Action Plan (LBAP)

A non-statutory plan prepared for a locality or region.

Locally native

See Native species.

MCFPE

Ministerial Conference on the Protection of Forests in Europe.

Minimum intervention

Management with only the basic inputs required to protect the woodland from external forces or to ensure succession of key habitats and species.

National Vegetation Classification (NVC)

A comprehensive classification of vegetation in the UK which is used to describe and assist in the evaluation of habitats.

Native species

Species which have arrived and inhabited an area naturally, without deliberate assistance by man. For trees and shrubs in the UK usually taken to mean those present after post-glacial recolonisation and before historic times. Some species are only native in particular regions. Differences in characteristics and adaptation to conditions occur more locally – hence ‘locally native’.

Native woodland

Woods mainly or entirely composed of locally native species.

Natural regeneration

Plants growing on a site as a result of natural seed fall or suckering. The term is also used to describe the silvicultural practices used to encourage natural seeding and successful growth of the seedlings.

Naturalised

A species long introduced to an area, which is capable of completing its life cycle there without human intervention.

New native woodland

New woodland especially designed and managed to develop a natural character by using communities of locally native trees and shrubs.

New planting

Establishing woodland on ground which was not woodland in the recent past.

Nurse crop

A component of a species mixture included to improve the growth rate, branching habit or cost of establishment of the other components. The nurse is removed in thinnings.

Permissive (use)

Use by permission, whether written or implied, rather than by Right.

Plantation

A woodland where the current trees have been planted. Often includes naturally regenerating trees as well. Includes former semi-natural woodlands restocked by planting.

Productivity

The capacity to produce forest goods and services. Usually applied to site conditions rather than to environmental and social benefits, such as landscape and conservation, although these are an essential component of sustainable development.

Protected habitats or species

Those protected by the EU Birds Directive, EU Habitats and Species Directive, Wildlife and Countryside Act 1981 (as amended) or Nature Conservation and Amenity Lands Northern Ireland Order 1985. (See Appendix 2.)

Protection

Measures intended to reduce damage (or the risk of damage) to individual trees and forests by pests, diseases, livestock, fire and people.

Provenance

Location of trees from which seed or cuttings is collected. Designation of Regions of Provenance under the Forest Reproductive Materials regulations is used to help nurseries and growers select suitable material. The term is often confused with 'origin' which is the original natural genetic source.

Public Register

Public listing (for a period of four weeks) by the FC of planting and felling proposals to allow public comment.

Public Right of Way

Legally defined route for defined categories of public access which landowners must not obstruct or divert without due legal process.

Reclaimed site

Industrial or landfill site made suitable for tree planting.

Recreation (forest) (Also see Access)

Activity or experience of the visitor's own choice within a woodland setting. (Facilities may sometimes be provided and charges levied for their use.)

Red Data Book

The Red Data Book comprises catalogues listing species which are rare or in danger of becoming extinct nationally or locally. (Details are available from the conservation agencies.)

Regeneration

Renewal of woodland through sowing, planting or natural regeneration.

Respacing

Thinning out of trees before canopy closure to create wider spacing.

Restocking

Replacing felled areas by sowing seed, planting or natural regeneration.

Retentions

Trees retained, usually for environmental benefit, significantly beyond the age or size generally adopted by the owner for felling.

Ride

Permanent unsurfaced access route through woodland.

Scarifying

Methods of shallow cultivation designed to create suitable positions for tree planting or a seed bed for natural regeneration.

Semi-natural woodland

Woodland composed of mainly locally native trees and shrubs which derive from natural seedfall or coppice rather than from planting. Ancient and semi-natural woodlands are defined as those known to be continuously present since 1600 AD (1750 AD in Scotland).

Shelterwood system

Felling of a proportion of the trees within an area leaving some trees as a seed source and shelter for natural regeneration. The seed trees are subsequently removed. (Compare with Coppice with standards, see above.)

Siltation

Deposition of waterborne particles within a watercourse, other body of water, or wetland.

Silt trap

Pits designed to catch silt before drainage water reaches a watercourse.

Silviculture

The techniques of tending and regenerating woodlands, and harvesting their physical products.

**Site plan**

Detailed work-site plan for operations carried out within the framework of the management plan.

Statutory conservation agencies (See Conservation agencies)

Structural diversity

Degree of variation in the spatial distribution of trees both horizontally (by distribution over area) and vertically (by the combined effect of different contribution of growth rates and ages of trees, and presence of other layers of vegetation).

Sustainable forestry (See pages 7–11)

Thinning

A temporary reduction in standing volume made after canopy closure to promote growth and greater value in the remaining trees.

United Kingdom (UK)

The United Kingdom of Great Britain and Northern Ireland.

UNFF

United Nations Forum on Forests

Watercourse

Streams and rivers. (When people refer to the management of the land adjacent to watercourses they usually also mean the land adjacent to ponds, lakes, etc.)

Windthrow

Uprooting of trees by the wind.

Windthrow risk

A technical assessment of risk based on local climate, topography, site conditions and tree height.

Woods (See Forestry)

Woodland

The part of woods and forests where the ecological condition is, or will be, strongly influenced by the tree canopy. In terms of land cover statistics (in UK), woodland is currently defined as land with trees where the mature trees would cover more than 20% by area.

Wood pasture

Areas of historical, cultural and ecological interest, where grazing is managed in combination with a proportion of open tree canopy cover.

PUBLICATIONS AND KEYWORD INDEX

APPENDIX 4

The following publications provide detailed guidance on issues, methodologies and practices from which this Standard has been developed. The Keyword Index which then follows can be used to locate relevant material.

The FC Guidelines, Guideline Notes, Practice Guides and Practice Notes are the primary references as are the DARD publications. Others provide updating information and more detail on specific topics and practices. Please see the FC publications web page: www.forestry.gov.uk/publications for further details of these, and other relevant publications.

Forestry Commission Guidelines

- Forest nature conservation guidelines (1990)
- Forests and water guidelines (4th edition 2004)
- Forest landscape design guidelines (2nd edition 1995)
- Community woodland design guidelines (1991)
- Lowland landscape design guidelines (1992)
- Forest recreation guidelines (1992)
- Forests and archaeology guidelines (1995)
- Forests and soil conservation guidelines (1998)

Forestry Commission Guideline Notes

- Forests and peatland habitats (2000)
- Short rotation coppice in the landscape (2001)

Forestry Commission Practice Guides

The management of semi-natural woodlands (1994):

1. Lowland acid beech and oak woods (1994)
2. Lowland beech-ash woods (1994)
3. Lowland mixed broadleaved woods (1994)
4. Upland mixed ash woods (1994)
5. Upland oakwoods (1994)
6. Upland birchwoods (1994)
7. Native pinewoods (1994)
8. Wet woodlands (1994)

Forest operations and badger setts (1995)

Involving communities in forestry through community participation (1996)

Whole-tree harvesting: a guide to good practice (1997)

Forest design planning: a guide to good practice (1998)

Hazards from trees: a general guide (2000)

Restoration of native woodland on ancient woodland sites (2003)

Reducing pesticide use in forestry (2004)

Forestry Commission Practice Notes

1. Nearest neighbour method for quantifying wildlife damage to trees in woodlands (1998)
2. The prevention of rabbit damage to trees in woodland (1998)
3. The prevention of mammal damage to trees in woodland (1998)
4. Controlling grey squirrel damage to woodlands (2004)
5. Red squirrel conservation (Reprinted with amendments 2001)
6. Managing deer in the countryside (1999)
7. Establishment of short rotation coppice (2002)
8. Using local stock for planting native trees and shrubs (1999)
9. Recommendations for fallow, roe and muntjac deer fencing: new proposals for temporary and reusable fencing (1999)
10. Nant-yr-Hwch long-term forest design plan: an example of good practice from the private sector (2000)
11. Practical techniques for surveying and monitoring squirrels (2001)
12. Handling and storing acorns and chestnuts and sycamore fruits (2002)

Other relevant Forestry Commission publications

Bulletin 112: Creating new native woodlands (1994)
 Bulletin 115: Alternative silvicultural systems to clear cutting in Britain (1995)
 Bulletin 123: Managing rides, roadsides and edge habitats in lowland forests (2000)
 Bulletin 124: An ecological site classification for forestry in Great Britain (2001)
 Bulletin 125: Climate change: impacts on UK forests (2002)
 Caledonian pinewood inventory (1994)
 Environmental Impact Assessment of forestry projects (2001)
 Field Book 8: The use of herbicides in the forest (1995)
 Field Book 14: Herbicides for farm woodlands and short rotation coppice (1996)
 Handbook 3: Farm woodland practice (1988)
 Handbook 6: Forestry practice (1991)
 Handbook 9: Growing broadleaves for timber (1993)
 Handbook 11: Creating and managing woodlands around towns (1995)
 UK indicators of sustainable forestry (2002)
 Undertaking an Environmental Impact Assessment in forestry and preparing an Environmental Statement (2001)

DARD/Forest Service publications

Conservation guidelines (DANI, 1987)
 Practical guide to forest recreation (DANI, 1997)
 Environmental guidelines for timber harvesting (Forest Service, 1999)
 Afforestation – the DANI statement on environment policy (DANI, 1993)

UK Woodland Assurance Standard publications

Certification standard for the UK woodland assurance scheme (2000)
 The UK woodland assurance scheme guide to certification (2000)
 Introduction to the UK woodland assurance standard (2003)

Safety Guides

Formerly published by FASTCo, now by AFAG.

AFAG Safety Guides are available from HSE Books (www.hsebooks.co.uk)

Other relevant publications

Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999

Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999

Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) 2000

Forest Reproductive Material (Great Britain) Regulations 2002



KEYWORD	SUBDIVISION	REFERENCE (as listed on page 63–5. All are FC unless otherwise stated)
Access	Advice	Forest recreation guidelines
	Permissive	Forest recreation guidelines
	Recreation	Community woodland design guidelines Forest recreation guidelines Handbook 11: Creating and managing woodlands around towns
	Rights of way	Forest recreation guidelines Practical guide to forest recreation (DANI)
Afforestation		<i>see New woodland</i>
Ancient monument		<i>see Heritage</i>
Archaeological feature		<i>see Heritage</i>
Biodiversity		<i>see Ecology</i>
Chemical		<i>see Herbicides, Pesticides, Fertilising</i>
Climate change		Bulletin 125: Climate change: impacts on UK forests
Cultural value		<i>see Heritage</i>
Deer (see also Tree damage)		Practice Note 6: Managing deer in the countryside Practice Note 3: The prevention of mammal damage to trees in woodlands
	Deer glades	Conservation guidelines (DANI) Forest nature conservation guidelines Handbook 6: Forestry practice Lowland landscape design guidelines
Design		<i>see Forest design</i>
Diversity (see also Ecology)		Community woodland design guidelines Bulletin 115: Alternative silvicultural systems to clear cutting in Britain Forest landscape design guidelines Forest nature conservation guidelines Handbook 6: Forestry practice Handbook 11: Creating and managing woodlands around towns Lowland landscape design guidelines
Drainage		Conservation guidelines (DANI) Forests and water guidelines Handbook 6: Forestry practice
	Conservation	Forests and soil conservation guidelines
Ecology (see also Diversity)		Bulletin 112: Creating new native woodlands Conservation guidelines (DANI) Forest nature conservation guidelines

KEYWORD	SUBDIVISION	REFERENCE (as listed on page 63–5. All are FC unless otherwise stated)
Ecology (cont.)		Forests and soil conservation guidelines Forests and water guidelines Practice Guides: The management of semi-natural woodlands (1–8) Practice Guide: Forest operations and badger setts
Edges		Conservation guidelines (DANI) Forest landscape design guidelines Forest nature conservation guidelines Forests and water guidelines Handbook 6: Forestry practice Handbook 11: Creating and managing woodlands around towns Lowland landscape design guidelines
Environmental Impact Assessment		Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) (2000) Environmental Impact Assessment (Forestry) (England and Wales) Regulations (1999) Environmental Impact Assessment (Forestry) (Scotland) Regulations (1999) Undertaking an Environmental Impact Assessment in forestry and preparing an Environmental Statement
Environmental protection	Archaeology Conservation Landscape Soils and water General	Forests and archaeology guidelines Forest nature conservation guidelines Forest landscape design guidelines Lowland landscape design guidelines Forests and soil conservation guidelines Forests and water guidelines Practice Guide: Whole-tree harvesting: a guide to good practice Afforestation – the DANI statement on environmental policy (DANI) Conservation guidelines (DANI) FASTCo Guides.102, 202, FSC 2 (now published by AFAG) Field Book 8: The use of herbicides in the forest Practice Guide: Reducing pesticide use in forestry
Fences		Forest landscape design guidelines Forest nature conservation guidelines Handbook 9: Growing broadleaves for timber Practice Note 6: Managing deer in the countryside Practice Note 3: The prevention of mammal damage to trees in woodlands
Felling		<i>see Harvesting</i>
Felling & regeneration systems		<i>see Silvicultural systems</i>
Fertilising		Bulletin 112: Creating new native woodlands Forests and soil conservation guidelines Forests and water guidelines Forest nature conservation guidelines

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Fertilising (cont.)		Handbook 11: Creating and managing woodlands around towns Handbook 3: Farm woodland practice Handbook 6: Forestry practice
Forest design		Community woodland design guidelines Conservation guidelines (DANI) Forests and archaeology guidelines Forests and water guidelines Forest landscape design guidelines Forest nature conservation guidelines Forest recreation guidelines Handbook 3: Farm woodland practice Handbook 6: Forestry practice Lowland landscape design guidelines Practice Guide: Forest design planning: a guide to good practice
Grey squirrel		<i>see Tree damage</i>
Harvesting		Bulletin 115: Alternative silvicultural systems to clear cutting in Britain Forests and archaeology guidelines Forests and soil conservation guidelines Forests and water guidelines Forest landscape design guidelines Forest nature conservation guidelines Handbook 6: Forestry practice Lowland landscape design guidelines Practice Guide: Whole-tree harvesting: a guide to good practice
Health & safety		<i>see Safety</i>
Herbicides		Field Book 8: The use of herbicides in the forest Field Book 14: Herbicides for farm woodland and short rotation coppice Forests and soil conservation guidelines Forests and water guidelines Handbook 6: Forestry practice Practice Guide: Reducing pesticide use in forestry
	Approvals	Field Book 8: The use of herbicides in the forest
Heritage		Forest landscape design guidelines Forestry Practice Advice Note: woodlands in designed landscapes Forests and archaeology guidelines Lowland landscape design guidelines
Landscape impact	Landscape appraisal	Community woodland design guidelines Handbook 3: Farm woodland practice Handbook 11: Creating and managing woodlands around towns

KEYWORD	SUBDIVISION	REFERENCE (as listed on page 63–5. All are FC unless otherwise stated)
Landscape impact (cont.)	Design principles	<p>Forest landscape design guidelines</p> <p>Lowland landscape design guidelines</p> <p>Community woodland design guidelines</p> <p>Forest landscape design guidelines</p> <p>Handbook 3: Farm woodland practice</p> <p>Handbook 6: Forestry practice</p> <p>Handbook 11: Creating and managing woodlands around towns</p> <p>Lowland landscape design guidelines</p>
Mixtures (planting)		<p>Bulletin 112: Creating new native woodlands</p> <p>Forest landscape design guidelines</p> <p>Handbook 9: Growing broadleaves for timber</p> <p>Handbook 11: Creating and managing woodlands around towns</p> <p>Lowland landscape design guidelines</p> <p>Practice Guides: The management of semi-natural woodlands (1–8)</p>
Nature conservation		<i>see Ecology</i>
Native woodland	All	Practice Note 8: Using local stock for planting native trees and shrubs
	New	<p>Bulletin 112: Creating new native woodlands</p> <p>Forest nature conservation guidelines</p> <p>Practice Guides: The management of semi-natural woodlands (1–8)</p>
	Existing	<p>Caledonian pinewood inventory</p> <p>Forest nature conservation guidelines</p> <p>Forests and soil conservation guidelines</p>
	Semi-natural	<p>Bulletin 112: Creating new native woodlands</p> <p>Forest nature conservation guidelines</p> <p>Practice Guides: The management of semi-natural woodlands (1–8)</p>
	Ancient	Practice Guide: Restoration of native woodland on ancient woodland sites
New woodland (see also Native woodland)		<p>Afforestation – the DANI statement on environment policy (DANI)</p> <p>Community woodland design guidelines</p> <p>Conservation guidelines (DANI)</p> <p>Forests and archaeology guidelines</p> <p>Forests and soil conservation guidelines</p> <p>Forests and water guidelines</p> <p>Forest landscape design guidelines</p> <p>Forest nature conservation guidelines</p> <p>Forest recreation guidelines</p> <p>Guideline Note 2: Short rotation coppice in the landscape</p> <p>Lowland landscape design guidelines</p> <p>Practice Note 8: Using local stock for planting native trees and shrubs</p>
Open space		<p>Community woodland design guidelines</p> <p>Forest landscape design guidelines</p> <p>Lowland landscape design guidelines</p>



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Operations	General	Conservation guidelines (DANI)
		Forests and archaeology guidelines
		Forests and soil conservation guidelines
		Forests and water guidelines
		Forest landscape design guidelines
		Forest nature conservation guidelines
		Handbook 6: Forestry practice
		Lowland landscape design guidelines
		Practice Note 8: Using local stock for planting native trees and shrubs
		Practice Guide: Whole-tree harvesting: a guide to good practice
Harvesting	Herbicides	Field Book 8: The use of herbicides in the forest
		Field Book 14: Herbicides for farm woodland and short rotation coppice
Pesticides	Site preparation	Practice Guide: Reducing pesticide use in forestry
		See statutory and guidance sections of product labels
Peat	General	Bulletin 112: Creating new native woodlands
		Conservation guidelines (DANI)
		Forests and soil conservation guidelines
		Forests and water guidelines
		Forest landscape design guidelines
		Forest nature conservation guidelines
		Handbook 6: Forestry practice
		Afforestation – the DANI statement on environment policy (DANI)
		Forests and soil conservation guidelines
		Guideline Note 1: Forests and peatland habitats
People	General	Community woodland design guidelines
		Field Book 8: The use of herbicide in the forest
		Forests and water guidelines
		Forest recreation guidelines
		Handbook 11: Creating and managing woodlands around towns
		Practical guide to forest recreation (DANI)
		Practice Guide: Involving communities in forestry
Pesticides	General	Forests and soil conservation guidelines
		Forests and water guidelines
		Handbook 6: Forestry practice
		Practice Guide: Reducing pesticide use in forestry
Recreation	General	Community woodland design guidelines
		Forests and archaeology guidelines
		Forests and water guidelines
		Forest landscape design guidelines
		Forest nature conservation guidelines
		Forest recreation guidelines
		Handbook 3: Farm woodland practice
Handbook 6: Forestry practice		

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Recreation (cont.)		Handbook 11: Creating and managing woodlands around towns Lowland landscape design guidelines Practical guide to forest recreation (DANI) Practice Guide: Forest operations and badger setts Practice Guide: Involving communities in forestry
Roads		Forest landscape design guidelines Forests and archaeology guidelines Forests and water guidelines Lowland landscape design guidelines
Safety		Safety Guides published by AFAG (formerly published by FASTCo)
Semi-natural woodland		<i>see Native woodlands</i>
Short rotation coppice		Guideline Note 2: Short rotation coppice in the landscape Handbook 3: Farm woodland practice
Silvicultural systems		Bulletin 115: Alternative silvicultural systems to clear cutting in Britain Community woodland design guidelines Forest nature conservation guidelines Handbook 11: Creating and managing woodlands around towns Lowland landscape design guidelines Practice Guides: The management of semi-natural woodlands (1–8)
Small woodlands	Design	Forest landscape design guidelines Forestry Practice Advice Note: Woodlands in designed landscapes Lowland landscape design guidelines
Social		<i>see People</i>
Structure		<i>see Diversity</i>
Tree damage	Deer	Handbook 6: Forestry practice Practice Note 3: The prevention of mammal damage to trees in woodlands Forest nature conservation guidelines Handbook 11: Creating and managing woodlands around towns Lowland landscape design guidelines Practice Note 6: Managing deer in the countryside
	Grey squirrel	Practice Note 3: The prevention of mammal damage to trees in woodlands Handbook 6: Forestry practice Practice Note 4: Controlling grey squirrel damage to woodlands
	People	Practice Note 3: The prevention of mammal damage to trees in woodlands Handbook 9: Growing broadleaves for timber Handbook 11: Creating and managing woodlands around towns
Water		Community woodland design guidelines Conservation guidelines (DANI)



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Water (cont.)		Forest nature conservation guidelines
		Forest recreation guidelines
		Forests and soil conservation guidelines
		Forests and water guidelines
		Practice Guide: Whole-tree harvesting: a guide to good practice
	Design	Forest landscape design guidelines
		Lowland landscape design guidelines
	Management	Forests and water guidelines
Woodland design		<i>see Forest design</i>

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