

Registering a seed stand on the National Register of Basic Material

Guidance for landowners and Managers

September 2022



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Background

The Forest Reproductive Material (Great Britain) Regulations provide a system of control for seed, cuttings and planting stock that is used for forestry purposes in Great Britain. This ensures that planting stock is traceable throughout the collection and production process to a registered source of Basic Material. In addition, it provides information on the genetic quality of the stock.

Forestry purposes is defined as woodland planting (woodland is an area greater than 0.25 hectare or more than 15 m in width, with a minimum of 20% canopy cover at maturity) of any description for any multi-purpose forestry purpose, including:

- timber production
- tourism
- recreation
- sport
- education
- amenity
- conservation and enhancement of the forest and woodland environment.

Forestry purposes excludes:

- landscape plantings for road and rail schemes
- urban planting relating to industrial and domestic developments
- production of Christmas trees.

The Forestry Commission is the official body responsible for the Forest Reproductive Material Regulations in England, Scotland and Wales. It has powers to ensure compliance with the Regulations and it can impose penalties for non-compliance.

The Forestry Commission has set up:

an official control system, which ensures that all reproductive material remains separated and clearly identified throughout the entire plant production process from collector to grower and to end user.

a public Register of Suppliers; only registered suppliers may market Forest Reproductive Material.

a voluntary scheme for the certification of native trees and shrubs.



Basic Material and Forest Reproductive Material

Basic Material is the plant material from which Forest Reproductive Material (FRM) is derived. There are six types of Basic Material:

Seed Sources describe all material which may range from a single tree to any collection of trees within a Region of Provenance, or Native Seed Zone (which includes an altitude band above or below 300 m).

Stands are specifically defined areas or groups of trees with identified boundaries.

Seed Orchards and Parents of Families are sources based on known individuals derived from tree breeding programmes. The FRM produced will be seeds.
Clones and Clonal Mixtures are also individuals from breeding programmes, but

the FRM will be produced through vegetative propagation.

Forest Reproductive Material (FRM) can consist of fruits, seeds and cones; all parts of plants obtained by vegetative propagation including embryos; and plants produced from any of these.

Usually, <u>only FRM that comes from registered Basic Material can be marketed</u>. There are four categories of reproductive material according to the Basic Material from which it is collected:

Source-identified FRM comes from general or specific locations within a single Region of Provenance or Native Seed Zone with an altitude band but with no specific superior qualities recognised.

Selected FRM is collected from stands showing superior characteristics, e.g. better form, growth rate, health.

Qualified FRM derives from the selection of superior individual trees which have not undergone any form of testing.

Tested FRM derives from the selection of individual trees or stands which have been evaluated for genetic quality or, in comparison to accepted standards, have been shown to be superior.

Regions of Provenance and Native Seed Zones

Great Britain is divided into four Regions of Provenance (ROP). These are defined areas within which similar ecological and climatic characteristics are found. They provide a framework for specifying sources of FRM. For native species, Regions of Provenance have been split into 24 smaller Native Seed Zones (NSZs). Seed zones themselves are

divided into two altitude bands, below and above 300 m. Figure 1 shows the main Regions of Proveanance, Native Seed Zones, and also the 7 zones for indigenous (native) Scots pine.



Figure 1: Regions of provenance and seed zones in Great Britain (including zones for indigenous Scots pine.)



National Register of Basic Material

The National Register of Approved Basic Material for Great Britain is the source of all information on approved Basic Material. The Forestry Commission maintains the Register and approves all material.



Each entry of Basic Material (unit of approval) in the Register is given a unique register identity encoding:

- Species
- Type of Basic Material
- Region of provenance
- Native seed zone
- Altitude and Origin.
- Category of FRM to be produced

There will be different amounts of information in the Register for each unit of approval e.g. records for stands and orchards contain more details than those for Seed Sources. In addition, information on time limits or production limits for reproductive material will be entered for sources given conditional registration. The category of reproductive material may change, depending on the quality of the Basic Material. The National Register can be viewed on the new online FRM system https://forest-reproductive-materials-forestergis.hub.arcgis.com/pages/public-apps



What is a seed stand?

A seed stand is a specifically defined area or group of trees with identified boundaries.

Types of Stands

Table 1 shows the types of Basic Material that can be used to produce reproductive material in each category.

Type of	Category of reproductive material			
Basic Material	Source- identified	Selected	Qualified	Tested
Seed Source	•			
Stand	•			
Seed Orchard			•	

The four categories of FRM that can be collected from the types of Basic Material are set out below.

Source-identified:

Source-identified FRM can only come from **Seed Sources** or **Stands**. There are no selection criteria relating to the quality of this Basic Material. The only restriction is that the collection must be made within the boundaries of a single Region of Provenance or Native Seed Zone. However, collection can take place at more than one site. Entries for Seed Sources in the National Register will only be described at the Region of Provenance level, and in addition, by seed zone for native species.



Seed Sources will generally not be inspected before they are registered with the Forestry Commission, and they will be described in the National Register as being of unknown origin. However, the Forestry Commission may approve indigenous stands in the Sourceidentified category where they meet the criteria set out below. This will enable indigenous stands of native species to be distinguished from those of unknown origin.

Definitions

The origin of a source is recognised as that part of the natural distribution of the species from which the material originally derived. A species is native to Great Britain if this is within its accepted natural distribution. All sources for which the origin is described as indigenous have the letter 'N' following the Basic Material type abbreviation in the National Register identity.

Origin is identified in the National Register in one of three ways:

1. Unknown - No information is available on the basis of which a description of the origin of the source can be confidently provided.

2. Non-indigenous - The origin of the material is known not to be from Great Britain. For a native species this means that there is clear information that the parental material was established from reproductive material which originated in a part of the species' natural range lying outside Great Britain. For a non-native species, the natural distribution of which does not encompass Great Britain, this will be the normal designation used when the origin is known.

3. Indigenous - The source will be a species which is native to Great Britain. Basic material eligible for registration can be recognised as:

<u>Natural stands</u>: the Basic Material will be growing at a site at which it can be assumed to have regenerated naturally since the existing woodland on the site became established.

<u>Planted stands</u>: the source will be a species native to Great Britain and will consist of planted material which has been raised from seed collected at a known site as described above.

Products of tree selection and breeding programmes: the individual trees represented are of indigenous origin and could be components of all types of Basic Material based on individual tree selection.



Natural stands

The Forestry Commission may inspect stands for which an application for registration as indigenous has been made in both the Source-identified and the Selected categories. Inspection will assess:

- □ the size of the population of trees being proposed
- □ the isolation of the material from other material of the same or a hybridising species of non-indigenous or unknown origin
- □ the authenticity of the material

Authenticity will be considered through any evidence available from:

- a natural spatial distribution of the trees with no evidence of a regular planting pattern
- an uneven and wide age structure among the trees indicating regular natural regeneration
- physical evidence of long-term management practices which are common in ancient woodland, such as coppicing or pollarding
- maps and management records indicating a long history of management using natural regeneration
- reference to the area in any inventory which lists recognized native or indigenous woodland

Applicants should obtain as much documentation covering the proposed area as possible and submit copies of this to the Forestry Commission with their application.

In view of the long history of human influence on native woodland in Britain, certainty of nativeness may be difficult to establish. It must be recognised, therefore, that a favourable balance of probability of nativeness can provide a basis for the acceptance of a proposed area for registration as indigenous.

Planted stands

Population size and isolation will be assessed as above. It is essential to have planting records indicating the exact origin of the material. It must be clear that no beating up with material of other origin has taken place.

In the case of newly created plantations of this type, the Forestry Commission will seek FRM control documents relating to the planting stock.



In situations in which the authenticity of the source population from which the material derived is in doubt, the Forestry Commission may need to inspect this original source as well as the plantation and assess it for the criteria outlined above for natural stands.

Products of tree selection and breeding programmes

Any selection of individual trees forming the basis of tree breeding work can take place in authentic indigenous woodland or in plantations with documented indigenous origin. The Forestry Commission will need evidence of this based on the criteria described above. It would be possible for this material to form components of all types of improved Basic Material based on individual tree selection (Seed Orchards, Parents of Families, Clones and Clonal Mixtures) in both the Qualified and Selected category.

Selected

Stands are the only type of Basic Material which may be registered for seed production in the category Selected. Approval of Basic Material in this category implies that the stand shows visual superiority in several important characteristics. This means that the majority of the dominant trees in the stand will be superior to representative material in that ecological zone in important factors such as growth rate, morphological quality and health. This is determined by formal inspection carried out by the Forestry Commission.

The basis of stand assessment will depend on the method of seed collection to be used. In situations where it is clear that the stand will be kept for regular seed collection from standing trees or from selectively felled seed trees, then the Forestry Commission will assess the quality of the dominant trees in the stand. Where the Forestry Commission cannot establish this, all trees will be assessed on the basis that seed will be collected at the time of clear-felling, as this is currently the most common method of collection in many conifers. Collecting seed from all felled trees, irrespective of their visual characteristics, could well result in the collected seed being a lower quality of seed compared to collecting seed from only the superior dominants in the stand.

Below are the criteria for the acceptance of Seed Stands as Basic Material in the *Selected* category of the National Register. All stands proposed for inclusion in the National Register will be inspected by the Forestry Commission who will consider the following:



Origin

-The clear designation of the stand as material of indigenous origin, of nonindigenous origin or of unknown origin must be determined.

□ Location and isolation

-Stands need to be situated at a sufficient distance from poor stands of the same species or from stands of a related species or variety which can form hybrids with the species being considered. This requirement is particularly important when the candidate stand is of indigenous origin and surrounding stands are not indigenous.

□ Effective size of population

-Stands must consist of one or more groups of trees, well distributed and sufficiently numerous to ensure adequate interpollination. To avoid the unfavourable effects of inbreeding, there must be a sufficient number of individuals on a minimum area. Plantations of coniferous species less than 4 hectares in area will not usually be considered.

□ Age and development

-Stands need to consist of trees which have reached an age at which acceptance criteria can be clearly judged.

Uniformity

-The individuals which comprise the stand must show a normal degree of variation in morphological characters.

Adaptation

-There must be evidence that the material is acceptably adapted to the Region of Provenance or seed zone altitude band for which registration is sought.

□ Health and resistance

-Stands should in general be healthy and show, in the place where they are growing, maximum resistance to harmful organisms and to adverse external conditions (other than resistance to damage by air pollution).

Volume production

-Where volume production is an essential criterion for approval it must be superior to the accepted mean under similar ecological conditions.

Wood quality

-This will be taken into account and may in certain circumstances be an essential criterion.



□ Form or growth habit

-Proposed stands need to show particularly good morphological features: in particular straightness and circularity of stem, branching habit, small size of branching and natural pruning. A low proportion of forked trees and of those showing spiral grain is expected.

Qualified and Tested

These categories cover FRM which normally derives from the results of tree improvement or breeding programmes, which will always be based on the selection of superior individual trees as parent material. These trees may be used to produce FRM either by sexual reproduction through seed (Seed Orchards, Parents of Families), or by asexual reproduction through vegetative propagation (Clones, Clonal Mixtures). The identities of the component trees will be retained in the Basic Material.

There are four types of Basic Material in these two categories:

Seed Orchard: a plantation based on individuals which are represented by vegetative propagules (usually grafts) or seedling progeny. The plantation is designed and managed to maximise inter-pollination of the components and to provide easily harvested seed crops.

Parents of Families, **Clones** and **Clonal Mixtures** are also either Qualified or Tested, however the main focus of this document is not on them. In theory, Stands can also be Tested, however in practice rarely are.

Qualified Basic Material involves using individuals selected only on the basis of their observed characteristics. It will not be known whether such superiority is genetic in origin, and thus likely to be passed on through seed or vegetative propagation. However, Tested Basic Material will have been subject to much greater scrutiny, through genetic testing of the parents, or comparative testing of the FRM produced.

Tested stands are different because they are based on populations of trees in which individuals have not been identified. A stand could be registered in the Tested category if the reproductive material raised from a representative seed collection, was found to be superior in performance to accepted standard material in comparative field trials. In practice, very few stands are tested.



Basic Material consisting of mixed stands

The Forest Reproductive Regulations state that if fruit or seed of closely related species (excluding artificial hybrids) does not reach a purity level of 99%, the purity of the fruit or seed must be stated on documentation and labelling used to separate lots during processing and on supplier's documents.

The main species of concern in Great Britain are sessile and pedunculate oak (*Quercus petraea* and *Q. robur*), silver and downy birch (*Betula pendula* and *B. pubescens*) and European and Japanese larch (*Larix decidua* and *L. kaempferi*). Impure seed collections could come from Seed Sources, Stands and Seed Orchards producing FRM in any permissible category.

In practice, the main sources of impure seed collections are in oak species. Areas of oak in which the species are mixed are relatively common in the UK and it is accepted that seed collections which fail to reach 99% purity will also be marketed. Because of this, it is important to recognise registered areas of Basic Material in which there is a mixture of both species, although the use of pure Basic Material is more straightforward and is encouraged wherever possible.

Basic material – Stands

Where the registered source is a stand, it is possible to estimate the relative proportions of each species (for oak, by using morphological characteristics of leaves and seed cups). Selected Stands are inspected before registration and inspectors will make purity estimates in all those of potentially mixed species at the time of inspection. Source-identified Stands are normally not inspected before registration. For these stands it is therefore important that applicants for registration make estimates of purity based on a sample of at least 30 trees, details of which must accompany their application for registration. For all mixed stands in either category, a note indicating that the stand is a mixture will appear in the National Register together with information on the relative proportions of the component species. The stand will, however, appear as a stand of the predominant species.



Basic material - Seed Orchards

For European and Japanese larch, equal numbers of representatives of each species are planted in a systematically integrated pattern to maximise the production of hybrid larch seed. Because of incompatibility in flowering times between the two species, a higher proportion of hybrid larch seed is found in collections from the European larch component than from the Japanese. To take advantage of this, seed is always collected separately from each species component and two entries for each orchard are made in the National Register, one for each species. The FRM is certified as hybrid larch.

Seed Orchards may be established for other species in which more than one species may be present. In these Seed Orchards, an assessment of the species purity must be made, and the estimate provided as part of the application for registration.

Seasonal variation in flowering – Stands

Although an estimate of purity will have been made among the parent trees in any stand, there is no guarantee that a seed collection will reflect these proportions because of seasonal variation in seed production among the species and individual tree present. It is therefore important that, in both Source-identified and Selected stands, collectors make estimates of the species purity at the time of collection by assessing the species of each tree from which they collect in the stand. This will only give an accurate estimate of purity if equal quantities of seed are collected from each tree and if there is a clear disparity in this, adjustment to the estimate must be made to reflect this. For example, this could be achieved by collecting separately from each species and determining purity by weight at the end of the collection. The basis of any estimates of purity should be indicated on applications for Master Certificates.

Alternatively, collectors may choose to collect from only one species in a stand shown as mixed in the National Register. It is conceivable that, in a season when only that species was producing seed, this could be from the species forming the lower proportion of the stand, the stand itself being registered as the other species.

Seasonal variation in flowering – orchards

The same levels of variation in flowering will be encountered in Seed Orchards, and species purity must be similarly estimated with respect to specific collections of seed. Because Seed Orchards have more detailed descriptions in the National Register, there



will be greater concern that individual seed collections should not reflect any major departure from the composition of the orchard described. In circumstances in which there is serious imbalance in flowering among the components of an orchard, collectors may be asked to market the seed as 'Parents of Families'. It is therefore important that early notification of seed collections from orchards is given to the Forestry Commission to allow sufficient time for such a decision to be made.

Certification of Forest Reproductive Material

The FRM Regulations require that information on species purity, where it does not reach 99%, must be recorded on all documents and labels used during processing and storage. This will include internal recording used by the supplier prior to application for a Master Certificate. This application must contain information on the percentage species purity estimates made at the time of collection and will appear on the Master Certificate under 'other relevant information'.

The Master Certificate will always identify the predominant species in the seed collection as the species being certified, even in instances when this is not the predominant species among the parental material in a registered stand.

Supplier's documents must be issued to all purchasers of seed. These must also contain the information on species purity given in the Master Certificate. The 'Comments' part of a Suppliers document should be used for this. The table below summarises conceivable situations using sessile oak (*qpe*) and pedunculate oak (*qro*) as examples.

Stand in the National Register			Collection				
Perc	Percentage		Percentage		MC/SD*	Comments	
qpe	qro	NR identity	qpe	qro	will indicate		
100		qpe	100		qpe 100%	Pure stand of qpe	
90	10	qpe	90	10	qpe 90%	Collection reflects proportions in stand	
70	30	qpe	55	35	qpe 55%	Collection does not reflect proportions in stand but reflects predominant species in collection	
70	30	qpe	40	60	qro 60%	Collection does not reflect proportions in stand, registered species now in minority	

*MC - Master Certificate; SD - Supplier's Document.



Seed Testing

It is a requirement of the Forest Reproductive Material Regulations that all seed marketed is accompanied by seed test results issued by an approved seed tester. One of the statutory requirements of a seed test is an estimate of species purity. It is conceivable that the methods used by seed testers could lead to species purity estimates which differ from those made by the collector and, in particular, for oak may identify a proportion of the seeds tested as of indeterminate species. Suppliers involved in the marketing of seed should be aware that such discrepancies can arise between Master Certificate information and Seed test certificate information, both of which will be summarised on any Supplier's documents issued, and they should draw the attention of customers to this as appropriate.



Registering as a Basic Material Manager

The old paper based FRM system was no longer fit for purpose, so we have developed and **recently rolled out a new <u>online FRM system</u>** - a more robust and user-friendly system that allows our customers more control and accessibility.

The new system will allow users to:

- Apply online to become a Basic Material Manager (BMM). Previously, when applying using the paper application you would identify yourself as the 'owner' or 'agent' – now, you will apply to be a Basic Material Manager – when you register you will be asked to enter the name and address details of the owner if you are not the owner.
- □ Apply online to register seed stands, seed orchards, clonal material or parents of family's material can only do this if you are already registered as a BMM.
- □ Once approved, update and amend details of their Basic Material

You may also apply online to become an FRM Supplier if you wish, which allows you to both notify us online of your intention to collect seeds or take cuttings, as well as apply online for a Master Certificate to market your collection.

How to apply to become a Basic Material Manager in the new system

Copy and paste this URL into your web browser: <u>https://forest-reproductive-materials-forestergis.hub.arcgis.com/</u>

You will be presented with the following screen – this is the FRM system log in page.





1. The first thing that you need to do is sign up – to do this you will need to SCROLL DOWN and click on the 'SIGN UP' button

☆	
C	✓ How do I get access?
	✓ What browsers are supported?
	Sign up Sign in

2. As you will see there are two drop downs to assist you – 'How do I get access' and 'What browsers are supported'. Once you have clicked on the 'SIGN UP' button you will be presented with the following screen.



3. When you receive your activation link you have 24 hours to log in and create your username and password.





4. Click on 'Create account'

5. You will now need to select the role you would like to apply for – scroll down the page and click on 'See Content'

6. A box will display, click on 'FRM Accounts'

7. Descriptions of each role type will be given. Scroll down and select your role.

8. Depending on which role you have chosen, you will be presented with the appropriate fields to complete. For a Basic Material Manager this will include: Name, company (if applicable), address, telephone number and email address.

9. Once submitted, the details will be checked by an FRM officer, and you will be advised of the outcome.

10. Once your account has been approved, log back into your account and you will see your 'name' where the sign in button was – to the left of that will be a little number in a red box – please click on this – you will then be presented with a message asking you to accept membership to the group for the role you have applied for (e.g. Basic Material Manager). You will not be able to do anything in the system until you do this.

11. Once you have accepted, please log out of the system, and then log back in. You should then see the applicable content for your role.



Registration of Basic Material

Procedures for registering Basic Material

The Forestry Commission will consider applications only from Basic Material Managers (owners, their agents or from those with the prior written authority of the owner). Please see <u>this page</u> for the species that are under the FRM Regulations.

□ When considering an application, the Forestry Commission may want to inspect the Basic Material and check all relevant information.

If the Forestry Commission accepts the proposed material, the applicant will be given a unique register identity.

□ If the Forestry Commission rejects an application, they will inform the applicant. Appeals against rejection can be made.

When FRM is to be produced from the Basic Material through vegetative propagation, the Forestry Commission may give approval for a specified number of years, a specified number of cycles of propagation, or a total number of propagules.

Stands: Source-identified or Selected

The online application for the registration of stands requires basic details, including:

- □ basic Material Manager details
- □ basic Material type, category, purpose and species
- basic material boundary (draw a polygon), Region of Provenance, Seed Zone (if native), latitude, longitude
- altitude of site
- □ details of origin (if known)
- □ planting year and area in hectares
- location details including Country, Forest or Estate name, location description and national grid reference
- year registered

It is unlikely that Source-identified stands will need to be inspected (unless they are indigenous), but inspections of proposed Selected stands will always be carried out.



Inspecting a stand

During a site visit, the Forestry Commission inspector will consider the quality of a sample of trees and will recommend whether the stand is accepted or rejected based on the proportion of the sample considered to be an adequate standard. The sample will be based on trees which form the dominant part of the canopy where it is clear that the proposed management of the stand would assume seed collection from individuals within this stratum. If not, it will be necessary for Forestry Commission staff to sample all parts of the stand canopy, e.g. when seed collection following clear-felling is proposed.

Inspectors will pay particular attention to the:

superiority of the individuals in the stand compared to other material of the same species in the same ecological zone

- isolation of the stand from inferior material of the same or a hybridising species
- size, area and stocking density of the stand.
- Percentage of acceptable trees, if the stand is meant to be selected quality

Inspection of Seed Orchards

Much of the information required for the approval of a Seed Orchard can be scrutinised away from the planting site. Inspectors will therefore concentrate on the effectiveness of isolation from inferior material of the same or a hybridising species and identifying individual components throughout the area. It is important that orchards are established and maintained in such a way that trees can remain individually identified so that detailed changes to the composition of the orchard, which could arise through death or thinning, can be recorded accurately.

Basic Material – owners' obligations

It is important that the **Forestry Commission is informed of any changes to Basic Material** to prevent marketing of reproductive material that does not meet the requirements of the appropriate category. Owners must tell the Forestry Commission of any reduction in area of the Basic Material, or any material change to its composition or stocking, no later than 28 days before a collection of reproductive material. <u>Changes to Basic Material can result in its downgrading to a lower category in, or its removal from, the National Register</u>. This may involve inspection.



Owners of Seed Orchards must notify the Forestry Commission, before seed collection, of any changes to the type; objective; crossing design; layout; components; isolation; or location of the orchard.

If an orchard is thinned, the owner must provide the Forestry Commission with details of the selection criteria used. Owners of Basic Material of the Parents of Families type must also inform the Forestry Commission of similar changes before seed collection.

Where Basic Material has received conditional approval, the owner must notify the Forestry Commission of the results of comparative testing or genetic evaluation when it is finished. This information must be provided no later than 28 days after the results have become available.

When approval of Basic Material is based upon stipulated limits to production through vegetative propagation, owners must inform the Forestry Commission within 28 days of these targets being reached.

Re-inspection of a stand

The Forestry Commission will periodically re-inspect Basic Material, giving at least 14 days' notice of a proposed site visit. Re-inspection will concentrate on any material changes to the area, structure and composition of the material that could take it below the threshold for that particular category. This could be caused by, for example, partial felling, windblow, disease, pest attack or thinning operations.

Withdrawal of approval

The Forestry Commission may remove an entry from the National Register or change it to a lower category if it is satisfied that the Basic Material no longer meets the relevant requirements. Removal of an entry applies equally to entries in the National Register which were originally approved under the previous Regulations. This may happen due to:

- □ failure of the Basic Material to meet the appropriate standards at re-inspection
- □ information provided by the owner as detailed above
- □ the lapse of a specified period of approval
- □ a specified level of production being reached.

The Forestry Commission will give an owner their reasons for removing an entry in writing. There is a right of appeal against any decision to remove an entry from the National Register.



Further Information

For further information, please see the Forest Reproductive Materials website

For queries on this document or any other FRM-related queries, please contact:

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