

# A protocol for undertaking woodland management in England where dormice are present

## Introduction

The **dormouse**, Britain's native common dormouse or hazel dormouse (*Muscardinus avellanarius* L.), is a small (weighing up to 35g) woodland mammal that is infrequently seen owing to its rarity and nocturnal habits.

Owing to its rarity and vulnerability to habitat changes the dormouse and the key habitat that it relies upon are protected by law. The dormouse is listed as a 'European Protected Species' (EPS) under the Conservation of Habitats and Species Regulations 2017 and it receives additional protection under the Wildlife and Countryside Act 1981.

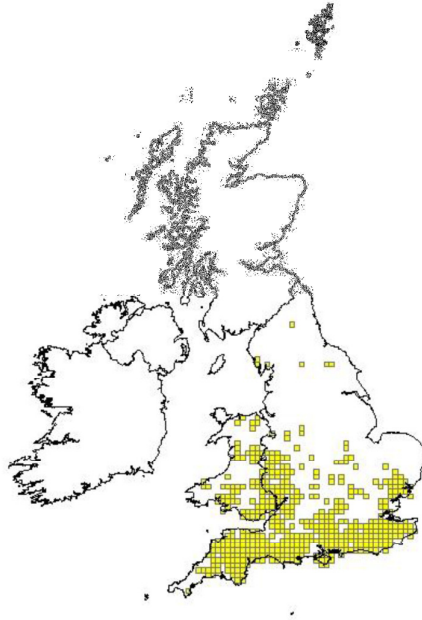
The Forestry Commission (FC) with assistance from relevant conservation organisations, including Natural England, Forest Research and Forest Enterprise has produced a suite of advice to help woodland managers and operators understand the law. This advice sets out 'good practice' for working in habitat where the species concerned – in this case the dormouse – may be present. Good practice advice explains what you need to do to operate within the law and how your woodland management activities can benefit the dormouse. Following the advice is valuable evidence that you have taken all reasonable steps to comply with the law. This is important because there is no 'incidental result of a lawful operation' defence under the 2017 Regulations, and you must either avoid impacts on dormice that are unlawful or you will need to proceed under the authority of a species licence.

Advice is given on routine and on-going forestry and woodland operations and activities. For more unusual operations, such as development, construction or land-use change (i.e. removal of forest) you should seek further advice from the FC. Similarly, whilst it covers low-key recreational usage, expert advice should be sought for more unusual or intensive activities in woodlands e.g., music concerts or motor rallying. This protocol should be used in conjunction with wider guidance on forestry and woodland management, and should not be followed in isolation. However, you are reminded that it remains your responsibility to ensure all your actions do comply with the law.

## Where dormice occur in England

Dormice are most frequently found in broadleaf woodland but can use all woodland, particularly species rich scrub/coppice, early growth stage plantations and forest edges. They occur at low densities; in early summer there are typically only 3 to 5 (but sometimes up to 10) adults per ha, numbers depend on habitat quality. The dormouse spends most of its active time high off the ground and passes at least a third of the year in hibernation. Dormice are usually active between April and end of October. Their food changes seasonally and is taken from a wide variety of trees and shrubs, and includes flowers, shoots, insects and fruits/seeds. Nests with young and day nests can be woven in bushes and shrubs; however, dormice also use hollow tree branches, squirrel dreys and old bird nests. Hibernation nests are small and tightly woven and are located at ground level under logs, under moss and leaves or among the dead leaves at the base of coppice stools and thick hedges.

Dormice are distributed throughout England but are found in a greater number of sites in southern England



Source: [http://jncc.defra.gov.uk/pdf/Article17Consult\\_20131010/S1341\\_UK.pdf](http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1341_UK.pdf)

Woodland management creates the habitats required by dormice. Leaving a woodland unthinned, especially young conifer or coppice uncut, eventually reduces the understorey and the quality of the habitat for dormice; maintaining a continuity and diversity of suitable habitat is necessary to sustain thriving dormouse populations over time.

For advice on identifying this species please see “**Further Information**” section.

This protocol is applicable to the management of all woodlands and forests inhabited by this species including within Special Areas of Conservation (SAC), Sites of Special Scientific interest (SSSI), and in the wider countryside.

### **How to manage woodlands and forests inhabited by the dormouse**

The overall outcome of management should be a mosaic of suitable habitats which are inter-connected and will provide a continuity of habitats over time. A key principle is to leave some areas of the woodland holding undisturbed during the planned operations to act as reserves or ‘refugia’ from which the local population can colonise the worked areas as they become more suitable. Larger woods with contiguous areas/ compartments with different ages and types of woodland structure are particularly suitable for dormice.

This protocol provides prescriptions and good practice for how activities and operations should be carried out. Prescriptions for operations (the timing, location and extent of their deployment) listed in **Section A** must be followed. The good practice set out in **Section B** is recommended to improve the woodland for dormice, but is not mandatory.

Applying the prescriptions/ best practice requires a consideration of the following three questions:

- What is the size and landscape context of the woodland holding to be managed?
- What is the quality of the habitat for dormice and where is it located within the woodland holding?
- At what time of the 'dormouse year' is the woodland activity or operation to take place?

#### Size and landscape context of the woodland holding to be managed?

For the purposes of this protocol a 'woodland holding' refers to all the wooded area the owner/manager has under their control and which lies close together and not separated by more than 500 m.

- A small and isolated woodland holding is defined as being <20 ha in size and >500 m from adjacent woodlands or hedgerows.
- A large woodland holding is either a single woodland >20 ha in size or a series of connected woodlands i.e. non-isolated woodlands covering at least this area.

The size ('small and isolated' or 'large') of the woodland holding containing the areas to be managed needs to be determined.

#### What is the quality of the habitat for dormice and where is it located within the woodland holding?

The main habitat for dormice is broadleaved woodland, with either a thicket coppice structure or mature woodland with a good understorey. However, they are sometimes found in mixed conifer plantations, especially those on ancient woodland sites. They may also be present in ride edges and shrubby glades, in scrub and thick hedgerows connected to woodland, and temporarily open areas within plantations.

The 'within woodland' habitat features listed in Table 1 are used to define dormouse habitat as: 'favourable' (habitat with most of the favourable features), or 'unfavourable' (habitat with only unfavourable features). This Protocol also refers to 'marginal' (habitat having only a few of the favourable features). Woods with an abundance of the favourable features are more likely to contain dormice, and are also likely to have higher populations and densities.

Table 1: Within woodland features which affect the suitability of the habitat for dormice

Favourable habitat features	Unfavourable features
<ul style="list-style-type: none"> <li>➤ Wide range of broadleaved tree species and age classes present, in patches, scattered throughout, or around the edge</li> <li>➤ Shrub layer present, especially with hazel, honeysuckle or bramble (brash can be a component of this structure)</li> <li>➤ Species-rich scrub on woodland margins, ridesides or in patches</li> <li>➤ Species-rich restock sites or new woodland creation sites especially if hazel, honeysuckle or bramble present</li> <li>➤ Canopy connections across tracks or thick, wide hedgerow connections to other nearby suitable habitat</li> <li>➤ Conifer/broadleaved mixtures or conifer plantations colonised by native broadleaves</li> <li>➤ Fruiting age trees especially hazel or sweet chestnut – ideally as managed coppice.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Plantation already subjected to several traditional rack thinning operations in conifers</li> <li>➤ Densely shaded with little or no understorey</li> <li>➤ Signs of deer/stock suppressing regenerating trees/shrubs, or lack of regeneration</li> <li>➤ Preponderance of waterlogged ground in winter</li> <li>➤ History of clearfelling of large management areas relative to the woodland area</li> <li>➤ Absence of large fruiting trees</li> <li>➤ Plantations lacking any native broadleaved trees and shrubs i.e. 'cleaned' conifers</li> <li>➤ Plantations from which all nurse conifers have been removed in one operation</li> <li>➤ Short rotation (&lt;7 yrs) coppice in cycle</li> <li>➤ Short sward e.g. regularly cut rides without any woody vegetation.</li> </ul>

- The woodland holding should be assessed and the location and extent of each area of favourable, marginal and unfavourable habitat should be mapped at an appropriate scale.
- The management areas should then be mapped and assessed in the context of the woodland holding in order to facilitate the prescriptions for woodland and forestry operations (see Section A below) to comply with good practice.

When in the 'dormouse year' is the activity or operation planned to take place?

Dormice are usually active from late March to the end of October, living in the shrub layer, but also feeding higher in the canopy. Based on dormice biology, the dormouse year is divided in to four periods:

1. May to mid-September (core breeding season)
2. Mid-September to end of October (pre-hibernation & active)
3. November to end of March (hibernation).
4. April (post hibernation & active)

This represents a typical dormouse year and a particularly early or late spring or winter will normally mean dormice are active several weeks earlier or later respectively. Southerly populations will generally be active for longer in a given year than northern ones.

- For dormouse conservation, different types of operations need to be scheduled to take place in particular periods of the dormouse year.

### Section A. Prescriptions for woodland and forestry operations covered by this protocol

For Period in the year, light to dark shading indicates most to least preferred time for working. Note in unfavourable habitat for dormice forest operations can proceed at any time of year, unless there is obvious evidence that dormice are present.

Operation*	Application	Typical specifications for process	Period in year	Large woodland holding (>20 ha in size or a series of connected woodlands i.e. non-isolated woodlands covering at least this area)		Small and isolated woodland holding (<20 ha in size and >500 m from adjacent woodlands or hedgerows)	
				Favourable habitat	Marginal habitat	Favourable habitat	Marginal habitat
<b>Mechanised/ Motor Manual Clear Felling or Coppicing of Trees</b>	In commercial harvesting where clear felling takes place at ~50yrs+.  Mechanised use possible in coppicing in very limited circumstances and depending on length of coppice cycle.	For mechanised harvesting acceptable to use large base unit (15-35T) with an articulated processing head to create windrows of logs and brash.  <b>Note: thresholds also apply to non-mechanised felling.</b>	May to mid-Sept	<b>Avoid carrying out operation</b>	Restrict operation to 10% of marginal area	<b>Avoid carrying out operation</b>	Restrict operation to 10% of marginal area
			Mid-Sept to end of Oct	Avoid unnecessary disturbance of the ground. Retain stands adjoining felled areas until the restocking [or natural regeneration] of the first coupe has reached a minimum height of 2 m; for planning purposes this is likely to be between 5 and 15 years depending on establishment success and growth rate. In ASNW <sup>1</sup> clear fell less than 10% of total favourable habitat area in any one five-year period. In all other woodland types (non-ASNW) clear fell or coppice less than one third of total favourable habitat area in any one five year period.	Avoid unnecessary disturbance of the ground. Retain stands adjoining felled areas until the restocking [or natural regeneration] of the first coupe has reached a minimum height of 2 m; for planning purposes this is likely to be between 5 and 15 years depending on establishment success and growth rate. In ASNW clear fell less than 10% of total favourable habitat area in any one five-year period. In all other woodland types (non-ASNW) clear fell or coppice less than one quarter of total favourable habitat area in any one five year period.		
			Nov to end of March				
			April				
<b>Mechanised/ Motor Manual Thinning &amp; Group Felling of Trees</b>	In commercial thinning and group selection felling within a stand. Initial thinning would create vehicle access route (rack) within stand, subsequent thinning would thin matrix of stand. Thinning would take place on 5-7 year cycle from age of ~20 years.	For mechanised harvesting acceptable to use base unit (15-25T) with an articulated processing head to create windrows of logs and brash.  <b>Note: thresholds also apply to non-mechanised felling.</b>	May to mid-Sept	<b>Avoid carrying out operation</b>	Restrict operation to 10% of marginal area	<b>Avoid carrying out operation</b>	Restrict operation to 10% of marginal area
			Mid-Sept to end of Oct	Thin less than two-thirds of area in 1 year, leave the remaining undisturbed for at least five years without further felling or thinning interventions.			
			Nov to end of March				
			April				

<sup>1</sup>Ancient semi-natural woodland (ASNW)- an area that's been wooded continuously since at least 1600 AD mainly made up of trees and shrubs native to the site, usually arising from natural regeneration.

Operation*	Application	Typical specifications for process	Period in year	Large woodland holding		Small and isolated woodland holding	
				Favourable habitat	Marginal habitat	Favourable habitat	Marginal habitat
<b>Extraction</b>	Post-felling/coppicing /thinning removal of timber (logs) from the felling site to a stacking/loading point.	Acceptable to use self-loading forwarder. Typically a tractor based multi-wheeled vehicle (8-30T) which loads timber onto the carrying bed with a self-propelled grab.	May to mid-Sept	Where possible extract material using a forwarder rather than a skidder and minimize extraction routes.  On steep slopes where skidding or high leading is the only practical option avoid extraction during winter months in favourable habitat.			
			Mid-Sept to end of Oct				
			Nov to end of March				
			April				
<b>Stacking</b>	Sorting and temporary storage of timber produce on or adjacent to hard surface loading bay or road/track within the woodland.	Acceptable for a forwarder using the self-propelled grab to place and sort timber prior to loading and dispatch by a road-going haulage vehicle (e.g. timber lorry).	May to mid-Sept	Place timber stacks where there is a hard standing or where vegetation is short. Where there is shrubby vegetation adjacent, do not remove stack between November and March			
			Mid-Sept to end of Oct				
			Nov to end of March				
			April				

Operation*	Application	Typical specifications for process	Period in Year	Large woodland holding		Small and isolated woodland holding	
				Favourable habitat	Marginal habitat	Favourable habitat	Marginal habitat
<b>Pre-Planting Ground Preparation</b>	Preparation of small and large clearfell coupes to make them suitable for restocking.  Also applies to areas where natural regeneration is being promoted	Acceptable to use tractor based techniques: bulldozing or raking of brash, lop and top and debris to form windrows; mulcher to mulch or chip debris prior to removal from site; ploughing to create planting furrow. Also acceptable to windrow brash and cut planting furrow in one operation by scarifying site or mounding.  <b>NOTE: Disturbance of soil should be avoided in native and ancient woodland. See Practice Guide<sup>2</sup> <i>Managing ancient and native woodland in England</i> for further advice.</b>	May to mid-Sept	Avoid scarification,/mounding or mulching/chipping/burning up of brash unless within a few months of felling and before the area becomes favourable or marginal habitat.			
			Mid-Sept to end of Oct				
			Nov to end of March	Restrict work to one third of the area of favourable and marginal habitat in the holding.	Avoid scarification/mounding or burning up of brash unless within a few months of felling and before the area becomes favourable or marginal habitat.		
			April	Avoid scarification/mounding or burning up of brash unless within a few months of felling and before the area becomes favourable or marginal habitat.			
<b>Pre-Planting Weed Control</b>	To control grass and shrub species that could compete with a young tree crop	Mechanical operations can use: -a tractor mounted swipe to cut vegetation down to ~5-10cm above ground level, and/or a tractor mounted mulcher to cut vegetation down to ground level, causing ground disturbance. Herbicides can be applied manually or by using a tractor/ATV-mounted boom sprayer, up to 4m wide. Glyphosate, asulam and propyzamide are considered non-hazardous to mammals  <b>NOTE: Use of pesticides and herbicides should be minimised in native woodlands and ideally avoided in ancient woodlands. Disturbance of soil should be avoided and mechanical control of shrubs should only be considered for non-native invasive species in native and ancient woodland.</b>	May to mid-Sept	Avoid carrying out mechanical operations. If using herbicides only, treat one third or less of gross marginal or favourable habitat area.		Avoid carrying out mechanical operations. If using herbicides only, treat 25% or less of gross marginal or favourable habitat area.	
			Mid-Sept to end of Oct	Treat one third or less of gross marginal or favourable habitat area.		Treat 25% or less of gross marginal or favourable habitat area.	
			Nov to end of March				
			April	Avoid carrying out mechanical operations. If using herbicides only, treat a third or less of gross marginal or favourable habitat area.		Avoid carrying out mechanical operations. If using herbicides only, treat 25% or less of gross marginal or favourable habitat area.	

<sup>2</sup> [https://www.forestry.gov.uk/pdf/FCPG201.pdf/\\$FILE/FCPG201.pdf](https://www.forestry.gov.uk/pdf/FCPG201.pdf/$FILE/FCPG201.pdf)

Operation*	Application	Typical specifications for process	Period in Year	Large woodland holding		Small and isolated woodland holding	
				Favourable habitat	Marginal habitat	Favourable habitat	Marginal habitat
<b>Restock Weed Control</b>	Grass and shrub species that compete with a young tree crop during establishment which need to be controlled.	<p>Manual, tractor/ATV (quad) based mechanical or herbicidal operations.</p> <p>Mechanical operations: a tractor mounted swipe to cut vegetation down to ~5-10cm above ground level, and/or a tractor mounted mulcher to cut vegetation down to ground level, causing ground disturbance.</p> <p>Herbicide operations: herbicide applied manually or by using a tractor/ATV (quad) mounted boom sprayer, up to 4m wide. Different herbicides are applied at different times of year The most widely used (glyphosate, asulam, propyzamide) are considered non-hazardous to mammals</p> <p><b>NOTE: Use of pesticides and herbicides should be minimised in native woodlands and ideally avoided in ancient woodlands.</b></p> <p><b>Disturbance of soil should be avoided and mechanical control of shrubs should only be considered for non-native invasive species in native and ancient woodland.</b></p>	May to mid- Sept	Avoid carrying out mechanical operations. If using herbicides only, treat one third or less of gross marginal or favourable habitat area		Avoid carrying out mechanical operations. If using herbicides only, treat 25% or less of gross marginal or favourable habitat area	
			Mid-Sept to end of Oct	Treat one third or less of gross marginal or favourable habitat area		Treat 25% or less of gross marginal or favourable habitat area	
			Nov to end of March				
			April	Avoid carrying out mechanical operations. If using herbicides only, treat one third or less of gross marginal or favourable habitat area		Avoid carrying out mechanical operations. If using herbicides only, treat 25% or less of gross marginal or favourable habitat area	



Operation*	Application	Typical specifications for process	Period in Year	Large woodland holding		Small and isolated woodland holding	
				Favourable habitat	Marginal habitat	Favourable habitat	Marginal habitat
<b>Open Space &amp; Ride Vegetation Management</b>	To control grass and shrub species that overgrow access routes or open habitats	Acceptable to use tractor/ATV- based mechanical operations using: - a tractor mounted swipe to cut vegetation down to ~5-10cm above ground level and/or - a tractor mounted mulcher to cut vegetation down to ground level, causing ground disturbance.  <b>Note: Disturbance of soil should be avoided in native and ancient woodland.</b>	May to mid-Sept	Avoid cutting taller vegetation. Any areas with a short sward may be mowed.			
			Mid-Sept to end of Oct	Any areas with a short sward may be mowed.  For areas of tall swards and/or woody vegetation treat one third or less of favourable or marginal habitat.		Any areas with a short sward may be mowed.  For areas of tall sward and/or woody vegetation, treat 25% or less of favourable or marginal habitat.	
			Nov to end of March	Any areas with a short sward may be mowed.  For areas of tall swards and/or woody vegetation, treat a third or less of favourable or marginal habitat.  For areas of shrubs, cut a maximum of 50 m by 10 m segments, working less than 10% of the area of favourable or marginal habitat and leaving the worked area uncut for a minimum of 8 years. Maintain branch connectivity at intervals over rides and tracks.		Any areas with a short sward may be mowed.  For areas of tall sward and/or woody vegetation, treat 25% or less of favourable or marginal habitat.  For areas of shrubs, cut a maximum of 50 m by 10 m segments, working less than 10% of the area of favourable or marginal habitat and leaving the worked area uncut for a minimum of 8 years. Maintain branch connectivity at intervals over rides and tracks.	
			April	Avoid cutting taller vegetation. Any areas with a short sward may be mowed.			

## EPS Checklist/ Woodland Management Plan

A checklist - **European Protected Species and woodland operations v3** (PDF 104 kb) has been developed to guide woodland owners and managers through the decision-making process of seeking grant or felling permission approvals.

Immediately prior to woodland management operations taking place an **Operational Site Assessment Form** should be filled in. This has also been developed to help woodland owners and managers consider the potential impacts of operations on site features including EPS and identify the measures required to follow good practice.

For more information on EPS (including access to the above checklists) and the steps land managers should take to safeguard them please see our EPS web page. [www.forestry.gov.uk/england-protectedspecies](http://www.forestry.gov.uk/england-protectedspecies)

The Woodland Management Plan must be approved by the Forestry Commission, before operations that could impact dormice begin, and it must be implemented as approved. The Woodland Management Plan and EPS Checklist must specify how a network of sufficient, suitable, high quality habitat will be maintained or improved to maintain favourable conservation status for dormice within the woodland area.

### **Section B. Good practice for woodland and forestry operations to help conserve dormice**

The following operations should improve your woodland for dormice

- Work to improve connections between areas of habitat within the woodland unit by developing a network of connecting strips/belts of scrub or retaining and promoting canopy contact ('pinch-points' or 'bridges') over rides.
- Creating a network of woodland habitat across the landscape, linking isolated woodland by creating new woodland and dense hedges.
- Enhance the shrub layer and understorey by coppicing, thinning or group felling to open up canopy gaps and promote woodland regeneration.
- Control or exclude livestock or deer to ensure adequate understorey and ground vegetation.
- Favouring broadleaves when thinning stands of conifer.

Specific advice should be sought from Natural England if particularly significant or important populations of dormice are present in proposed work areas, to ensure operations are appropriate.

### **What about other protected species which might be present in the woodland?**

This guidance should be used in conjunction with wider guidance on forestry and woodland management, and should not be followed in isolation. Managers should be aware that there is the potential for more than one protected species in their woodland, which for example may support bats and dormice, and will need to follow the approved guidance for each of the species present.

## Sources of further information

Forestry Commission England European Protected Species web pages:

<http://www.forestry.gov.uk/england-eps>

Bright, P., Morris, P. & Mitchell-Jones, T. (2006) *The dormouse conservation handbook*. Second edition. pp74. English Nature, Peterborough. [NB Pre 2007 legislative changes].

Strachan, R., Miller, H. (2014) European Protected Species in Woodlands – A Field Guide. Forestry Commission England.

[http://www.forestry.gov.uk/pdf/EP5A6FieldGuide.pdf/\\$file/EP5A6FieldGuide.pdf](http://www.forestry.gov.uk/pdf/EP5A6FieldGuide.pdf/$file/EP5A6FieldGuide.pdf)

FC Bulletin 123 'Managing rides, roadsides and edge habitats in lowland forests.

[https://www.forestry.gov.uk/PDF/FCBU123.pdf/\\$FILE/FCBU123.pdf](https://www.forestry.gov.uk/PDF/FCBU123.pdf/$FILE/FCBU123.pdf)