

GUIDELINES FOR
THE TREATMENT OF BATS
DURING THE CONSTRUCTION
OF NATIONAL ROAD SCHEMES



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ENVIRONMENTAL SERIES ON CONSTRUCTION IMPACTS

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INTRODUCTION

This document outlines the requirements that should ideally be met in the pre-construction (site clearance) and construction phases of a road scheme to minimise negative impacts on resident bats, or prevent avoidable impacts resulting from significant alterations to the immediate landscape. Prior to the commencement of any site works, the Contractor should be familiar with all bat mitigation measures specified in the Environmental Impact Statement (EIS). During the preparation of the EIS, reference will have been made to the following document *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes* (National Roads Authority, 2005). The definition and requirements of a bat specialist are addressed in that document.

While these guidelines focus on the impacts on bats during the construction of new national road schemes, the best practice procedures outlined can also be adopted for road realignment and bridge maintenance programmes.

PROCEDURAL ADVICE

Prior to construction, it is important that all relevant personnel are made aware of any structures or areas that are known to be important to bats and the legal protection afforded to bats and their habitat. Buildings, bridges or trees should not be removed or destroyed prior to an appropriate survey undertaken by a bat specialist. It is also recommended, where appropriate, that the specified mitigating measures are in place prior to any demolition activity. It is important to note that the destruction of any

bat roosts without appropriate authorisation from the National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government could result in significant delays in the construction of a scheme or possible prosecution under the Wildlife Acts, 1976 and 2000.

It is recommended that a notice be erected on all buildings, trees and bridges that were identified in the EIS as potential bat roosts. The following is an example of such a notice:

WARNING
THIS IS A BAT ROOST. NO PERSON SHALL REMOVE THIS STRUCTURE UNLESS CLEAR INSTRUCTION IS GIVEN THAT IT IS SAFE TO DO SO. FAILURE TO COMPLY WITH THIS WARNING IS AN OFFENCE PUNISHABLE UNDER THE WILDLIFE ACTS, 1976 and 2000.

In addition, it may also be beneficial to include a bat motif on such a sign and to further identify the structure by the erection of red and white tape and/or the use of spray paint.

It is important that a clear warning system, such as the examples proposed, is agreed with the site contractor in advance of site clearance. It is also important that all operatives are aware of the nature of any system used and this is especially so for all new staff and sub-contractors.

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Front Cover Picture: Pipistrelle Bat. © Duncan McEwan/naturepl.com

CONSTRUCTION PHASE

The most significant impact of road construction upon bats is in the clearance phase of the scheme, namely tree-felling, the removal of hedgerows and other vegetation and the demolition of buildings.

TREE-FELLING AND HEDGEROW REMOVAL

To facilitate earthworks and road construction, vegetation cover within the land take is removed, both for the major roads and for access roads and lanes. This may include mature hedgerows, consisting of typical shrub species, and mature and semi-mature trees. These habitats are very important in areas that have been shown to have good potential for bats.

Trees are a highly important feature of landscapes in that they provide roost sites throughout the year as well as being essential sources of insect prey. Therefore, the removal of such trees reduces the availability of shelter and feeding sites for bats.

In general, all trees with potential for bat roosts, on and along the land take of the selected route, will have been identified during the preparation of the EIS. It is important

to ensure that such trees are re-examined before tree-felling commences. Tree-felling poses an immediate risk of injury or death to bats and a number of measures can be taken to reduce this risk to a negligible level. The following guidelines should reduce risks to bats during tree-felling. A bat specialist should be consulted to ensure that the appropriate guidelines are followed.

LICENSING IN ADVANCE OF TREE-FELLING

All bats, and trees that are identified as bat roosts, are afforded legal protection by the Wildlife Acts, 1976 and 2000 and the EU Habitats Directive (under S.I. 94 of 1997). To proceed with the felling of these trees, it is necessary to obtain a licence from the NPWS.

TIMING OF SURVEYS AND FELLING WORKS

In areas that are identified in the EIS to have a bat presence, the following guidelines outline when surveys and felling works should be undertaken.



Whiskered Bat. (Photograph Phil Richardson)

Tree-felling poses an immediate risk of injury or death to bats and a number of measures can be taken to reduce this risk to a negligible level.

- Where trees of importance to bats are situated along the boundary of the land take, the potential of retaining these trees should be outlined in the EIS and discussed with the site contractor prior to site clearance (*NRA Guidelines on the Treatment of Trees on National Road Schemes*, National Roads Authority, in preparation).
- Tree-felling should ideally be undertaken in the period late August to late October/early November. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
- Immediately prior to felling, the trees should be examined for the presence or absence of bats, and/or other bat activity. This survey should be carried out by a suitably qualified bat specialist and should include a visual inspection of the tree during daylight hours followed by a night time detector survey (see guidelines for surveying trees for bats (section 3.3.3) in the NRA publication *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes* (National Roads Authority, 2005). The survey should be carried out from dusk through the night till dawn to ensure that bats do not re-enter the tree.
- Where an autumn examination of a tree has shown that bats have not emerged or returned to a tree, it is safe to proceed with the felling of the tree the following day, once the appropriate tree-felling licence, if required, has been secured. Such an inspection confirms the status of the tree only at the time of inspection and where there is a delay of one day or greater the tree must be re-assessed.
- In areas where bats are known to exist, tree-felling should not be undertaken in June, July and early August, in order to ensure that breeding populations of bats are protected. Bats typically form maternity roosts from late May onwards and single young are born in June or July. The young are totally dependent upon their mothers and are unable to fly, or to take any evasive action, that would save them from the dangers imposed by the felling or major surgery of a tree.
- Felling during the winter months is to be avoided as this creates the additional risk that bats may be in hibernation and thus unable to escape from a tree that is being felled. Additionally, disturbance during winter may reduce the likelihood of survival as the bats' body temperature is too low and they may have to consume too much body fat to survive.



Noctule Bat. © Dietmar Nill/naturepl.com

UNCONFIRMED BAT ROOSTS

If the bat specialist is in doubt regarding the presence of bats (i.e. if there is a possibility that the bats did not emerge due to low temperatures, rain etc., or if observation of their return may have been obscured by vegetation), a close-up inspection of the tree should be undertaken immediately prior to felling. Such an inspection is desirable in all cases where trees have been previously used as a roost site.

CONFIRMED BAT ROOSTS

Where a bat roost has been identified in a tree during previous survey work, felling of the tree in question should be postponed until it is known that bats have naturally left the tree (unless there is an immediate health and safety risk).

EXCLUSIONS OF CONFIRMED BAT ROOSTS

- Where bats are still present within an identified roost (that is neither a breeding nor a hibernation roost) following repeated postponement of felling, it will be necessary to undertake exclusion procedures. These will allow bats to exit from a tree but not to return. The exact method used will depend on prevailing conditions. The bat specialist will advise on the steps necessary for exclusion and the likely time period required. This exclusion process must be done under licence from the NPWS.



Pipistrelle Bat. © Jim Hallett/naturepl.com

- Access to the tree by means of a hoist or teleporter is essential for exclusion procedures as it will be necessary to access all potential crevices to block bat entry. The exit site will require a means of creating a one-way valve to allow bats to leave but not to return. Where it has proved impossible to exclude the bats, the tree should be felled in stages. This will require the lowering of major limbs to the ground by rope and pulley. If the exact location of the roost is known, particular attention should be paid to removing this section. Wedges should be driven into obvious crevices in the tree to prevent their closing during removal.
- If a tree containing a known bat roost must be felled outside the optimum period (under licence from the NPWS), the bat specialist must endeavour to remove any bats to safety. Living bats should be taken from the tree and released once all tree-felling in the area has concluded. Any dead bats should be recorded and a note should be submitted to the NPWS detailing the circumstances of the incident.
- It is important to ensure implementation of the mitigation measures proposed in the EIS/Environmental Operating Plan (EOP) to compensate for the loss of tree roosts.

If a tree containing a known bat roost must be felled outside the optimum period (under licence from the NPWS), the bat specialist must endeavour to remove any bats to safety.

EQUIPMENT

Specialised rope access, a hoist and harness or a teleporter with a safety basket and harness will be required to undertake a close-up inspection of a tree. All suitable features, including any bird and bat boxes, should be inspected for the presence of bats. Deep crevices can only be examined with a fibrescope and this must be used for known bat roosts.

TREE-FELLING PROCEDURES

Tree-felling can be undertaken using heavy plant and chainsaw. There is a wide range of machinery available with the weight and stability to safely fell a tree. Normally trees are pushed over, with a need to excavate and sever roots in some cases. In order to ensure the optimum warning for any roosting bats that may still be present, the tree should be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist.

Trees that are known to be bat roosts should not be sawn up or mulched immediately. A period of at least 24 hours, and preferably 48 hours, should elapse prior to such operations to allow bats to escape.

When felling trees with a chainsaw, it is important to ensure that the rate of fall is not accelerated by the use of a chain and vehicle (e.g. tractor). It is unlikely that a bat would survive such a heavy impact.

HEDGEROW REMOVAL

Hedgerows and treelines form a major component of the commuting routes for bats as well as important feeding sites. Bats have been shown to follow linear landscape features at night. It is also believed that migration or long-distance flights are dependent on discernible landscape features.

Trees, shrubs and other scrub in fields or along rivers may connect bat roosts or roosts to feeding areas. It is essential that summer roosts and hibernation sites are not isolated from other roosts or from good feeding areas (e.g. rivers and woodland) during the construction period. A bat specialist must ensure that there is provision for bats to continue to cross along the line of a road until permanent mitigation for the roost is in place (e.g. planting regime or bridge/underpass). This may necessitate the provision of a temporary fence across the route and an area in which light is restricted.

A bat specialist should identify or confirm the sites for planting of vegetation corridors proposed in the EIS/EOP. To ensure that the guidelines for planting are understood and properly implemented to accommodate bat activity and movement, it is essential that a bat specialist provides on-site advice on the planting of vegetation and its relationship to bridges, underpasses or culverts.



Nathusius Pipistrelle. © Hans Christoph Kappel/naturepl.com

DEMOLITION OF BUILDINGS

The demolition of houses, farm buildings, etc., within the land take of the road poses a risk to bat safety. Buildings are highly important as roosting sites for bats and all Irish bat species use buildings for all roost types. Most significant in terms of roosts in houses are maternity roosts, but cellars and even attics may serve as hibernation sites for bats. Roosts within buildings can far exceed the numbers encountered in trees, bridges, caves or cliffs and roosts of over 1,000 bats have been recorded in buildings. Very often bat presence goes unnoticed by householders or keyholders unless there are in excess of 20 individuals.

Prior to demolition, buildings that were identified in the EIS as either having bats or having the potential for bats should be re-examined. This is the responsibility of the bat specialist employed for the road scheme. The key areas for consideration in all building types are attics, window frames and cellars (or similar associated structures).

Buildings with roosting bats should not be demolished during the breeding period (late May to mid-August) as the risk of accidental death or injury is too great at this time.

DEMOLITION PROCESS

Buildings with roosting bats should not be demolished during the breeding period (late May to mid-August) as the risk of accidental death or injury is too great at this time. Known hibernation sites should not be demolished in winter.

In exceptional circumstances where demolition must proceed in buildings known to contain bats, the special mitigation measures specified in the EIS to protect bats must be put in place and a licence to derogate from the conservation legislation must be sought from the NPWS.

The procedure to be followed for the demolition of buildings depends on whether bats are suspected or known to be present. In all cases, immediately in advance of demolition, a bat specialist must undertake a comprehensive examination of the building. If bats are present at the time of examination, it is essential to determine the nature of the roost (i.e. number, species, whether it is a breeding population of bats), as well as its exact location.



Lesser Horseshoe. (Photograph Conor Kelleher)

If bats are active at the time of year of the examination, a full bat detector assessment of the building should be carried out. This should be an all-night examination to ensure that no bats enter the building during the night or early morning from an alternative site. This will provide adequate information to proceed with demolition unless weather conditions were unsuitable for feeding bats. This decision should be made by the bat specialist, based on temperature, atmospheric pressure and/or rainfall. Demolition equipment should be in place on the following day if no bats are present in the building. The bat specialist should be on-site to supervise the demolition procedure.

Although detailed bat surveys are carried out during the EIS phase, there is the potential that bats may be discovered after construction has commenced. In such circumstances, a detailed survey should be undertaken and appropriate mitigation measures should be agreed with the NPWS.

Where it is noted by the bat specialist that bats are roosting within a building, demolition must not proceed unless the agreed mitigation measures are in place.

Where bats are accessible, it may be possible to relocate them until all demolition is complete. The bats can be released into the surrounding area once they are not at further risk from demolition or tree-felling.

Where bats are inaccessible it will be necessary to undertake an exclusion procedure to avoid unnecessary injury or death to bats. This will require the installation of one-way valves over suitable access points. The bat specialist will advise on the appropriate materials and location of these fittings.

Exclusion measures may take three to four nights to be successful and a bat detector assessment of the building should be carried out immediately prior to demolition to ascertain that no bats are trapped within the building.



Brandt's Bat. © Dietmar Nill/naturepl.com

Careful removal of fascia may ensure that any overlooked bats are unharmed. Where there are clear signs that bats have roosted or are possibly roosting (but undetectable) it may be necessary to remove ridge tiles and flashing manually. In such circumstances, in order to allow time for bats to vacate the building, it may be prudent to remove half the roof on the first day and the second half 24 hours later. The bat specialist must determine the likelihood of bat presence and advise on the appropriate measures of demolition.

If structural destabilisation has commenced, it is clearly unsafe to cease demolition. In such circumstances, every effort should be made to disturb resting bats in a controlled manner. Noise, vibrations and warming will all provoke awakening in bats and it is likely, if sustained will ensure the departure of bats. The bat specialist should advise on the best means, with safety in mind. If bats are noted during the removal of fascia or tiles, the bat specialist should take all accessible bats into temporary care.



Leisler's Bat. © Dietmar Nill/naturepl.com

BRIDGE DEMOLITION OR RE-STRUCTURING

In the past bridges were largely overlooked as bat roosts in Ireland but recent studies have shown that bats do roost in such areas.

Bats such as the Daubenton's bat avail of masonry arch bridges (and other designs) as roosts throughout the year. Many of these masonry bridges are incapable of dealing with the weight of modern traffic and are either replaced entirely or occasionally serve as a substrate for the incorporation of wider bridge structures. This may be achieved by the installation of culverts or the construction of a parallel deck.

Where bats are roosting, the building works may have a detrimental effect through closure of crevices via re-pointing or shot-creting. If such work is carried out on bridges with breeding bats, young may be abandoned.

Bridge alteration or demolition for road schemes should be monitored by the bat specialist employed to examine and supervise operations likely to affect bats.

The bat specialist must determine whether any bridge undergoing work for the road scheme serves as a bat roost prior to construction. This will require a visual inspection with a fibrescope and light beams and a bat detector assessment lasting the period of an entire night in advance of the commencement of operations to demolish or expand the bridge.

Where bats are found to be present, if possible, work should be postponed. Given the scale of operations to a bridge, a protracted delay may not be a viable option. At the very least, a delay of a number of days should be secured to attempt an exclusion procedure upon the bridge. The bat specialist will advise on the procedure and materials required for exclusion.

Scaffolding will almost certainly be required for access to the bridge to install all exclusion one-way valves.

The bat specialist must determine whether any bridge undergoing work for the road scheme serves as a bat roost prior to construction. This will require a visual inspection with a fibrescope and light beams and a bat detector assessment.

For bridges, such valves may vary from fruit netting to traffic cones. Scaffolding will also allow the incorporation of any mitigation measures (e.g. bat boxes, purpose-designed sections with crevices or cavities).

POST-CONSTRUCTION MONITORING

Upon completion of the road construction, monitoring at the appropriate season should be undertaken by a specialist to determine the effectiveness of the mitigation measures employed. This can only be carried out with the permission of the landowner, where the measures in question are outside the landtake for the road. Monitoring should be continued for at least two years after construction work ceases. Where possible, any deficiencies in the implemented mitigating measures should be corrected.



Daubenton's Bat. © Dietmar Nill/naturepl.com

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