

# Rapid response mitigation to noctule *Nyctalus noctula* roost damage, Buckinghamshire, UK

Chris J. Damant\* and Emily L. Dickins

Bernwood ECS, Dodley Hill Farm, Station Road, Swanbourne, Buckinghamshire, UK

## SUMMARY

Historical records over the last century suggest an overall decline in UK bat populations, with the cause speculated to include a decline in roost availability. In 2009, a noctule maternity roost was recorded in an ash tree within ancient semi-natural woodland in Milton Keynes, UK, where up to 75 bats including lactating females were recorded. In December 2011, the ash tree was accidentally felled by contract staff operating on behalf of the landowner whilst carrying out ride habitat and tree safety management as the tree was considered to be a public safety concern. A mitigation and compensation strategy was implemented, with a noctule maternity colony returning in 2012 and 2013. The landowner has subsequently altered internal working practices in relation to bats and trees. This case study exemplifies the need for sharing ecological data records within organisations, and to and from third parties. Good record keeping including photographic and video evidence together with a 'rapid response' procedure is demonstrated.

## BACKGROUND

Historical records over the last century suggest an overall decline in UK bat populations. It is speculated that, amongst other factors, a decline in roost availability continues to be a significant threat to bat populations (BCT 2013). The noctule bat *Nyctalus noctula* (Vespertilionidae) is widely distributed across England, Wales and as far north as central Scotland (Harris *et al.* 1995). The National Bat Monitoring Programme reported an overall decline in this species since its commencement in 1997 (BCT 2012) with a smaller decline in numbers recorded between 2008 and 2011. This prompted their inclusion as a Priority Species in the UK Biodiversity Action Plan (Harris *et al.* 1995). In Milton Keynes, Buckinghamshire, records of roosting noctules are usually from woodlands but they are also frequently recorded in flight around Milton Keynes, above built up areas and linear features such as the railway line and habitat corridors. Individual male and female noctules are known to use bat boxes in Milton Keynes woodlands (pers. obs.)

In 2009, a noctule maternity roost was recorded in an ash tree *Fraxinus excelsior* located within a 23 ha ancient semi-natural woodland in Milton Keynes (SP 824 360), by a member of the local bat group (Figure 1). The landowner was notified of the roost at the time. The tree was subsequently subject to surveys; 47 noctules emerged from the roost at dusk on the 23 May 2010 and 70-75 on the 16 July 2010 (Table 1). Hand netting had confirmed the presence of lactating females in the summer of 2009 and 2010.

In December 2011, contract staff, operating on behalf of the landowner, felled the tree whilst undertaking ride habitat and tree safety management. The tree had been identified as a risk to public safety as it leant over a main woodland ride and had characteristics consistent with internal rot, i.e. woodpecker holes and a vertical split. The contract staff considered the risk of bats being present, but when they observed two grey squirrels emerging from the trunk they assessed the tree to be unsuitable as a bat roost. Once the landowner realised it was the noctule roost that had been felled, the processing of the

timber was halted and a local licensed bat ecologist, experienced in designing and executing bat mitigation and compensation schemes was contacted. Within hours of the tree being felled, the roost was confirmed as vacant, a mitigation strategy developed and Natural England notified. The top of the tree, including one woodpecker hole, was removed along with a length of the central cavity. This left two woodpecker holes, linked by a central cavity together with a vertical split up the reverse of the trunk (Figure 1).

## ACTION

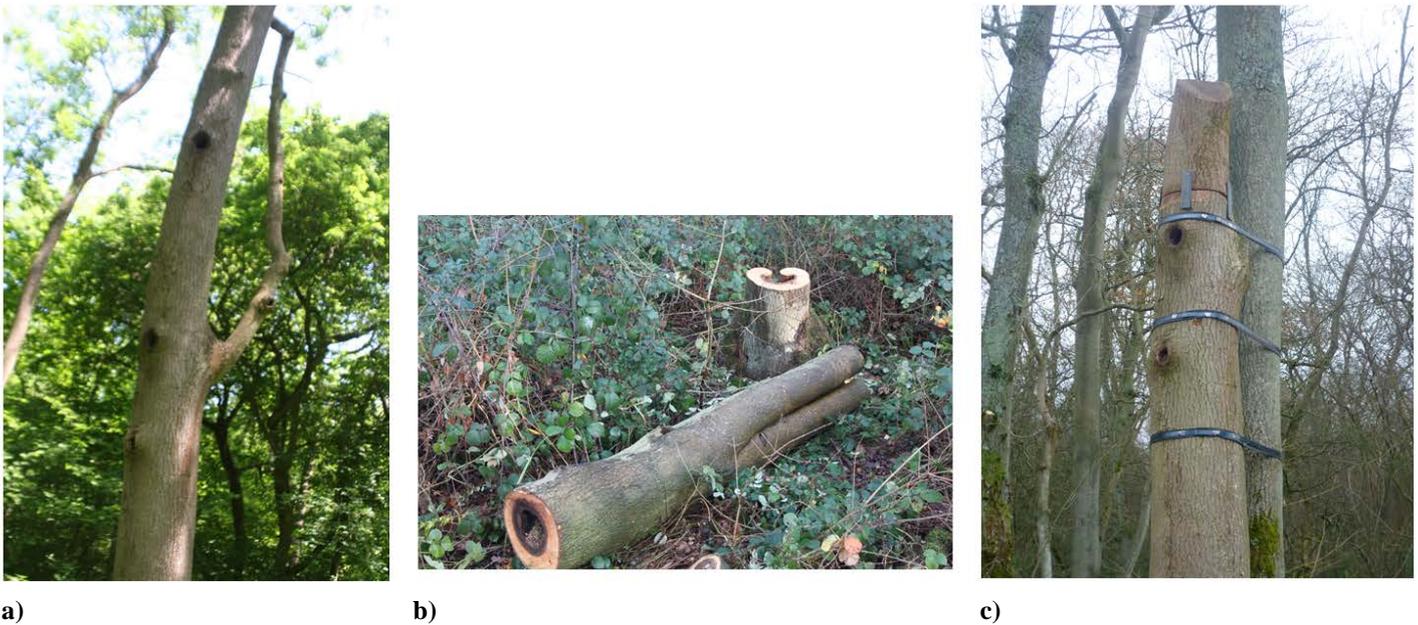
Survey information from 2009 and 2011 including photographs and night shot video footage was used to identify bat access points including the height and orientation.

The mitigation included reinstating the trunk against the nearest suitable tree (ash). A high lift was used to assist with the lifting of the trunk and it was fastened to the tree using 19 mm steel banding. Protective rubber straps were placed between the steel banding and both tree trunks to reduce the impact on the live tree. The access points were orientated to recreate their original positions prior to felling. A replacement top was constructed from ash wood to shelter the roost, replicate internal environmental conditions and prevent an increase in decay through weathering. The top was bonded to the trunk with steel straps (Figure 1). The reinstated section complete with top totalled 3.4 m tall by 0.5 m wide (1.1 m wide when attached to the live tree).

Compensation roosts were provided using five Schwegler woodcrete 2FN bat boxes (Schwegler Bird and Conservation Products, Schornodorf, Germany). In addition, cavities were created in other live ash trees to stimulate rot; crown weight was reduced to maximise the longevity of these trees.

The planning and execution of the reinstatement was carried out over five consecutive days with two individuals delivering the mitigation and compensation measures, including in-house arboriculturalists, ecologist support and machinery.

\* To whom correspondence should be addressed: [chris@bernwood.net](mailto:chris@bernwood.net)



**Figure 1.** a) Noctule tree roost prior to felling; b) felled tree roost showing internal rot and vertical split; c) reinstated tree roost.

## CONSEQUENCES

Post mitigation surveys to date have been undertaken by a licensed bat ecologist, members of the local bat group and representatives of the landowner. Surveys have confirmed the roost to be active in subsequent maternity periods (Table 1). Checks on the use of the compensation bat boxes were inconclusive due to all boxes being utilised by nesting birds; some observed deposits, which may have been bat droppings, were degraded and could not be positively identified.

**Table 1.** Pre- and post-mitigation monitoring results (\* = post mitigation).

Monitoring Date	Emergence Count
23 May 2010	47
16 July 2010	70-75
8 July 2012	37*
27 May 2013	46*

## DISCUSSION

The value of biological recording and photographic evidence significantly improved the effective delivery of mitigation; particularly in ensuring correct bat access point heights and orientations were achieved. Post-mitigation monitoring has demonstrated the continued use of the ash trunk as a noctule roost with consistency in the numbers of bats present compared to those recorded in the roost prior to felling.

The management of trees, whether through forestry operations or arboricultural practices can lead to a loss of tree roosts for bats despite the best endeavours of landowners and

contractors to follow good practice guidelines (Hundt 2012). In this instance, the unfortunate damage of a roost occurred. This case study highlights the need for sharing records within organisations and the importance of exchanging data with third parties. The rapid response shown by the landowner improved the opportunity to deliver a conservation strategy with positive results. The landowner demonstrated their responsibility to biodiversity through a willingness to accept consequences and reduced the likelihood of future incidents through addressing weaknesses in operational structure, particularly in relation to tree roosts. The resourceful mitigation measures that were implemented further illustrate the potential of creative thinking when responding to accidental damage of important ecological sites.

## ACKNOWLEDGEMENTS

We thank Toby Thorne, Jo Hodgkins and Jeremy Halls for their valuable feedback on the manuscript and all those involved in the successful re-instatement of the noctule roost.

## REFERENCES

- Bat Conservation Trust (2012) The state of the UK's bats. National Bat Monitoring Programme Population Trends 2012. The Bat Conservation Trust, London.
- Bat Conservation Trust (2013) Threats and Bats. [http://www.bats.org.uk/pages/threats\\_to\\_bats.html](http://www.bats.org.uk/pages/threats_to_bats.html) (accessed 10 July 2013).
- Harris, S., Morris, P., Wray, S. & Yalden, D. (1995) A review of British mammals: population estimates and conservation status of British mammals other than cetaceans. JNCC, Peterborough.
- Hundt, L. (2012) Bat Surveys: Good Practice Guidelines, 2nd Edition. Bat Conservation Trust.