

Best practice example:	Placement of standing deadwood (monoliths)
Project:	Ancient woodland feature translocation
Client:	Fusion/HS2
Location:	Calvert, Buckinghamshire
Timescales:	2019 – 2020 (Feasibility study) 2020- 2021 (Translocation works)
Background	
<ul style="list-style-type: none"> • Translocation of the existing deadwood was supplemented by the felling of live trees to create a new generation of 'green' deadwood. 	
Importance of aerial deadwood habitats	
<p>Deadwood habitats are a critical component of a healthy woodland ecosystem, which should comprise deadwood of varying stages of decomposition to provide a range of functions:</p> <ul style="list-style-type: none"> • Dead stumps often provide shelter so are colonised by small pockets of woodland floral species; • Fallen deadwood pieces, log piles and brash provides valuable habitat for colonisation by species such as reptiles, hedgehogs and invertebrates; • Decomposing deadwood on the woodland floor provides mycorrhizal fungi material and woodland soil micro-fauna essential for tree and soil health. • Standing deadwood trees create an aerial layer of deadwood habitat. This is very important as bats will use these features as flight paths to navigate by while out hunting, as well as using their multiple features such as holes or peeling bark which make suitable roosting or hibernation places. They are used by birds as a vantage point to identify potential food sources/ danger and sometimes for nesting. 	
Recreation of deadwood features	
<ul style="list-style-type: none"> • It is relatively easy to recreate most of the deadwood features found in a healthy woodland, since they are generally found at ground level; existing or new features can be placed into position by hand (for small sized features) or using heavy plant for larger features such as stumps or large limbs. • Providing standing deadwood features is more problematic; existing standing deadwood cannot be translocated because it is decomposing and therefore is fundamentally unsafe to move from a health and safety point of view. • Large living trees cannot be translocated as their root systems are too established to survive being disturbed during excavations and it is technically very challenging, though not impossible, to move a large tree safely. 	

Technical method for recreation of standing deadwood 'monolith' features

- The following method was derived to enable some of these trees to become deadwood 'monoliths':
 - Live oak specimens were straight felled/cut using excavator & tree shears and root balls removed.
 - Once cut, the weight of tree was calculated to determine its suitability to be placed as standing monolith using the FISA industry standard method of calculation¹. This involves taking the dimensions of the section (using the mean width) and multiplying it by the density. All specimens used for monolith creation were oak and handled immediately after felling, therefore mass calculations for lift plans were based on the specific gravity of wet oak.
 - Lift Plans for the plant machinery involved were calculated using an additional 50% Factor of Safety.
 - An augered pit was prepared at receptor site to approximately one third of the height of the tree – measuring of the depth of the excavation was carried out using an excavator dipper to check it was of sufficient size for the monolith being placed.
 - Once the pit was prepared, the specimen was moved using a forestry forwarding trailer and lifted into position with a 13 tonne (or larger) excavator and timber grapple.
 - A second excavator was used to backfill and dynamically compact soil around the specimen once it was placed into the pit.
 - Final soil compaction was carried out using hand tools/ foot pressing to ensure the monolith was firmly in position.

Benefits

- 31 No. monoliths were positioned within the receptor site; they will be a very important component of the establishing woodland, until it reaches maturity and is capable of producing its own deadwood features. The monoliths were around the site in strategic locations but concentrated along the central woodland ride to help create a future bat flight line.
- Re-use of specimens as monoliths rather than simply felling them for use as timber in sawmills is a sustainable solution under the HS2 sustainability theme 'Environmental Protection and Management'.
- So far, four bird of prey species have been recorded using the monoliths as perches which is very encouraging.



Above left: Auger attached to excavator preparing pit



Above right: Monolith being lifted into position

¹ [Forestry Commission Booklet: Forest mensuration handbook \(forestresearch.gov.uk\)](http://forestrycommission.gov.uk/Forestry-Commission-Booklet-Forest-mensuration-handbook-forestresearch.gov.uk)



Above left: Monolith secured in prepared position



Above right: Once monolith is secured, machines can work safely in close proximity to it



Above: Various views of monoliths in position, demonstrating how they add diversity and ecological enhancement to the quality of the receptor site