Ancient Woodland Soil Translocation Case Study

Ancient Woodland Name	Unnamed Woodland south of the B4115 Ashow Road in Stoneleigh
Location	Stoneleigh, Warwickshire, central grid ref SP 32065 72361
HS2 Contractor	Laing Murphy Joint Venture (LM JV)
Relevant supply chain and role	ThreeShires Ltd working with Lockhart Garratt Ltd

Background

The donor site was bounded alongside the B4115 Ashow Road by a common hawthorn hedge and by an old sunken lane to the south. About 250m long, the maximum width of the woodland is 45m at the western extremity, narrowing to 20m at the eastern end.

The canopy consisted of ancient, tall oak with ash, birch, beech and wych elm (the latter much diseased), together with planted copper beech and grey poplar. Much of the understorey is overrun by rhododendron and bracken. Several ancient indicator species were also recorded including holly, wood millet, native bluebell, yellow pimpernel, remote sedge and three-nerved sandwort. The NVC community type at the donor was intermediate between W10 Quercus robur-Pteridium aquilinum-Rubus fruticosus and W8 Fraxinus excelsior-Acer campestre-Mercurialis perennis.

The Environmental Statement and the Phase One ancient woodland strategy identified an area of 0.2ha of ancient woodland that would be removed where the scheme cuts through the woodland.

Brief description of work

- 0.1 ha of soil moved as turfs from donor to receptor areas
- Number of coppice stools, living trees and standing deadwood translocated
- Number of nursery trees planted in the receptor site

The soil was originally planned to be translocated by loose stripping. However, soil surveys from the donor site (auguring and soil 'pits') indicated a litter layer which was variable in thickness from 2 cm to 5 cm. This is beyond the capability of even the most experienced machine operator to collect consistently and the bucket would push the litter layer into a

pile rather than getting underneath to give an undisturbed layer. There was also the potential damage to shallow rooting plants with bluebell bulbs and other plant roots (raspberries, nettles, bracken and brambles) occurring between 12 cm and 15 cm depth.

It was therefore decided to move the material in turfs, taking a depth of soil 20 - 25cm to allow for bulb roots to be included and reduce the potential drought stress. Where the Ah horizon was deeper than 25cm, then a deeper turf was cut and moved, sometimes including a shallow layer of the donor B horizon at the base of the turf which also provided a better interface with the receptor site subsoil. This also removed the need to loose tip any donor soil which would mix litter layers and Ah layers (uncultivated horizon containing an intimate mixture of mineral soil and humified organic matter).

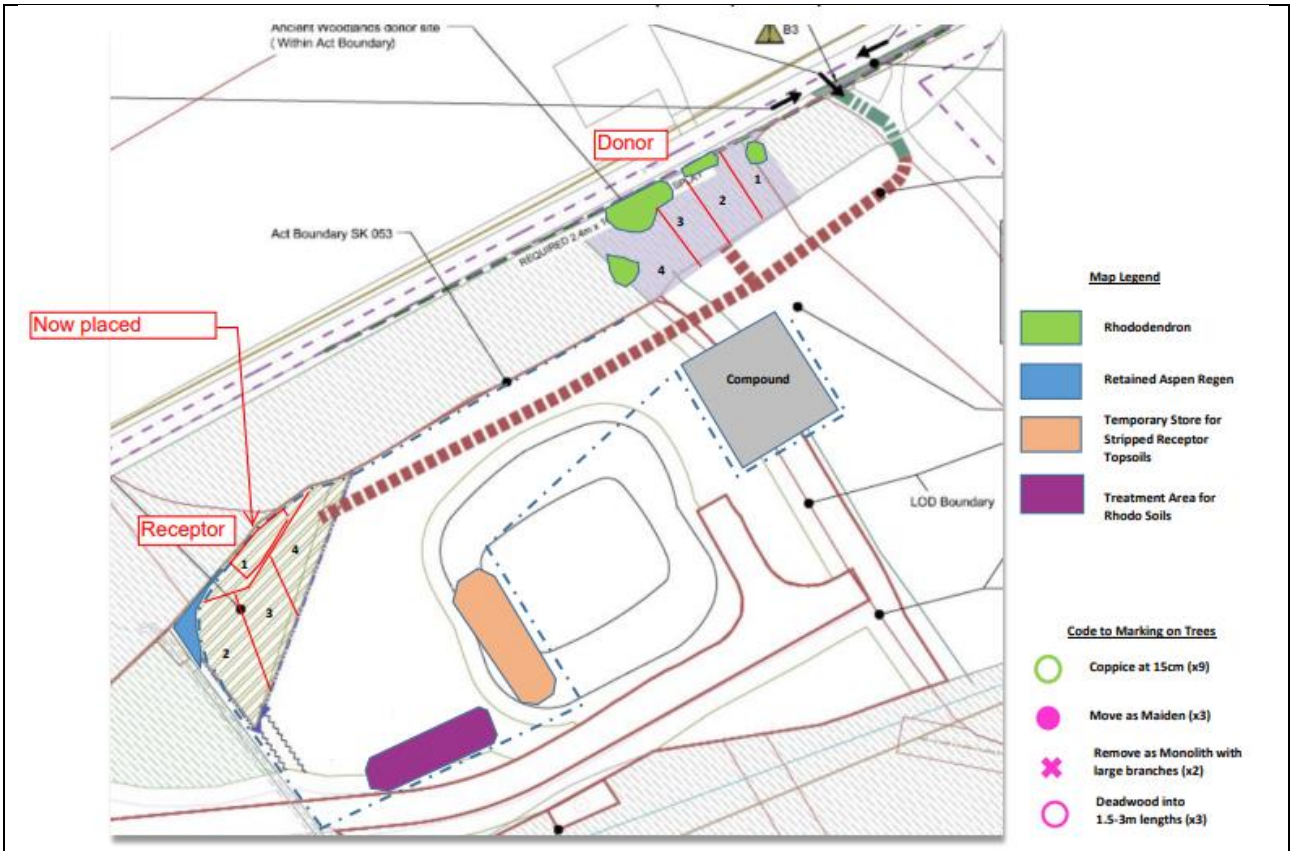
The brambles and nettles were first cut to 10cm height to gain access to the area and the raspberry canes were then lifted by hand, bagged, stored in the shade and later replanted at the receptor site.

Prior to removing the donor turf the area was lightly raked to remove any litter and bits of twig from ground vegetation removal. This was put into 1 tonne builders' bags and manually spread on the surface of the placed turfs at the receptor site.

To take the donor turf a 1.8m wide x 1.2m deep toothless bucket was used to cut around a 1.6m x 1m turf. This cutting served to cut roots up to 2 inches that would otherwise have loosened and possibly destroyed the turf.

To avoid running on donor soil, collection started in an easily accessible spot and advanced across the site. At this time all coppiced stools had been marked as well as small box and holly plants, for replanting at the receptor.

The receptor site soils were removed as and when needed for that day's work to avoid unnecessary desiccation of the underlying receptor subsoil. Machinery was allowed to run on the receptor topsoil which was then removed when required to the appropriate depth. This prevented subsoil compaction prior to placement of donor turfs. The receptor subsoil was loosened using a landscape rake on the excavator arm to about 10 - 15 cm and not the 45 cm as originally specified because the receptor subsoil had not been trafficked and any compaction would only be from the bucket as receptor topsoil was removed. Each donor turf was placed and the flat of the bucket was then used to lightly consolidate the soil (without causing compaction) to avoid desiccation.



Phasing map of Ashow Road ancient woodalnd soils translocation (Lockheart Garratt)

Key equipment used on site	A 13 tonne tracked excavator with a Kinshofer fully rotating / swivelling wrist was used to lift and place the turfs with a high degree of accuracy. Turfs were placed to a flatbed trailer with 40-50cm high sides i.e. high enough to hold the turfs in place but low enough to allow good visibility by the machine operator handling the turfs.
Programme and resources	During the period of active soil movement which lasted 17 days, on average, 75 m^2 of turf was moved each day using one excavator which tracked between the donor and receptor sites which were located approximately 300m apart.
Innovation	The turf translocation was a pioneering method for movement of woodland soils. It has been used in the past for movement of field turf and there was initial concern that the roots and stumps would hamper the turf method but the use of a skilled

	operator and fully swivelling wrist linkage made the method possible.
Immediate maintenance	The translocation was undertaken in April, May and June 2020 on light sandy soils. The donor soils were therefore watered on placement at the receptor site to aid establishment and reduce transplanting shock on coppice stools, saplings and standards.
Constraints and solutions	*Rhododendron ponticum* was identified on the west and north fringes of the donor site prior to the translocation work, totalling 250 m^2 as low growing bushes. These areas were cordoned off by the ecologist supervising the site and a 0.5m standoff kept for turf lifting. On completion of all viable turf movement, the rhododendron vegetation was then cut, chipped and removed from site for composting. Meanwhile, a compound area was established approximately 80 m from the receptor site and laid with Terram geomembrane. Rhododendron soils were then loose stripped from the donor site and all root material was handpicked and removed for composting. The rhododendron soils were then placed in the compound area, spread 20 cm deep, picked over again and seeded with a low maintenance amenity grass seed mix. Any rhododendron seedlings regrowing on this quarantined soil were removed by hand picking for another 12 months. This soil will ultimately by re-used in nearby landscaping and has not therefore been lost from the site.
Lessons learnt	Don't be dogmatic; treat each site individually. If there is scope within good practice to achieve a better result, raise that at the point of soil surveys and discuss proposed alternatives with the Client. Don't be afraid to go back to the Client with suggested amendments of the method once you have a more detailed knowledge of the soils and vegetation on the site. Where translocating in a dry Spring, have water available for irrigation of the placed turfs to assist establishment. Also, on sandy soils, the turf will hold together better where it is slightly moist (not at field capacity) so again, have water available to assist cohesion on lifting.

Cutting a turf containing a small box tree

Donor soil in foreground awaiting removal and stripped donor site in background

Receptor site showing laid turves from donor site (background) and cleared receptor prior to 'ripping' subsoils

Receptor site showing standard box and holly trees translocated with their root ball from the donor site and watered after placement to assist establishment

Prepared receptor site following loosening of subsoils with landscape rake

Removal of turf from donor site, containing bracken stems

Placing donor turf at receptor site, containing bluebell bulb growth

Turf after placing and light consolidation

Regrowth of receptor site in Spring 2020

Regrowth of receptor site in Spring 2020