

COMMUNITY WOODLAND ESTABLISHMENT ON THE AVON LEVELS AND ARCHAEOLOGICAL SITE ASSESSMENT: A CASE STUDY

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INTRODUCTION

Lower Knole Farm is situated just north of Bristol on the Avon levels surrounded by the M4, M5 and M49 motorways. The site lies within the Avon Community Forest area and an application was made to establish a woodland on part of the farm. However, like much of the wider Avon and Severn Estuary Levels, the application area is regarded as land with archaeological potential. Concerns were therefore expressed over the depth of any buried archaeological evidence and the possibility of hydrological and physical rooting impacts following woodland establishment. This note outlines the work carried out at the site to enable a risk assessment to be made.

SITE DESCRIPTION

Descending west from the village of Almondsbury, Gloucestershire, the landscape changes rapidly from a ridge of Carboniferous and Triassic rocks (80 m AOD) to low lying Holocene estuarine deposits (<10 m AOD). The farm is located at the base of the slope and extends onto the alluvium. A series of subsoil field drains reduce the soil water content and discharge into large ditches known locally as rhines.

During the installation of a gas pipeline across the site in 1997, several sherds of Roman origin were found along with a feature cut into the Triassic Mercia Mudstone believed to be of similar date (Haigh, pers comm). The area proposed for woodland (shown in Figure 1, overleaf) was predominantly flat, but there was a small hill in field F. The site at the time of grant application was used for pasture, the exceptions being three areas of existing woodland. The lowest point was under Square Covert wood,

where peat deposits were known to exist following their exposure in field O during the pipeline installation.

AUGER SURVEY

During the summer of 1999 the 67 ha application area was surveyed using a hand auger (Dutch type) to a depth of 1.7 m. A total of 60 soil profiles were recorded. The data were used to produce maps of soil types and properties at five different depths (Crow 2000). This indicated that at least 1.7 m of alluvium dominated the site, though the underlying Mercia Mudstone was encountered in field L within this depth. The bedrock then dipped in a north-westerly direction before rising briefly to form the small hill in field F. Thus, prior to the alluvial inundation, these areas would have formed high points at the edge of the floodplain providing an ideal environment for a settlement location. Conversely, towards the lowest ground at the eastern edge of field O, the waterlogged remains of common reeds (*Phragmites communis*) were found at depths of >1 m. Under Square Covert wood, this developed into waterlogged peat deposits at 0.7 m.

The grey clays and silty clays that dominated the site were typically mottled between the depths of 0.5 m and 1.5 m, indicating seasonal waterlogging throughout much of the sampled profiles. Waterlogged conditions prevailed beyond 1.5 m.

GEOPHYSICAL SURVEY

A geophysical survey was commissioned in 2000 and carried out by Stratascan Ltd to assess various techniques and their ability to determine any archaeological and geomorphological features

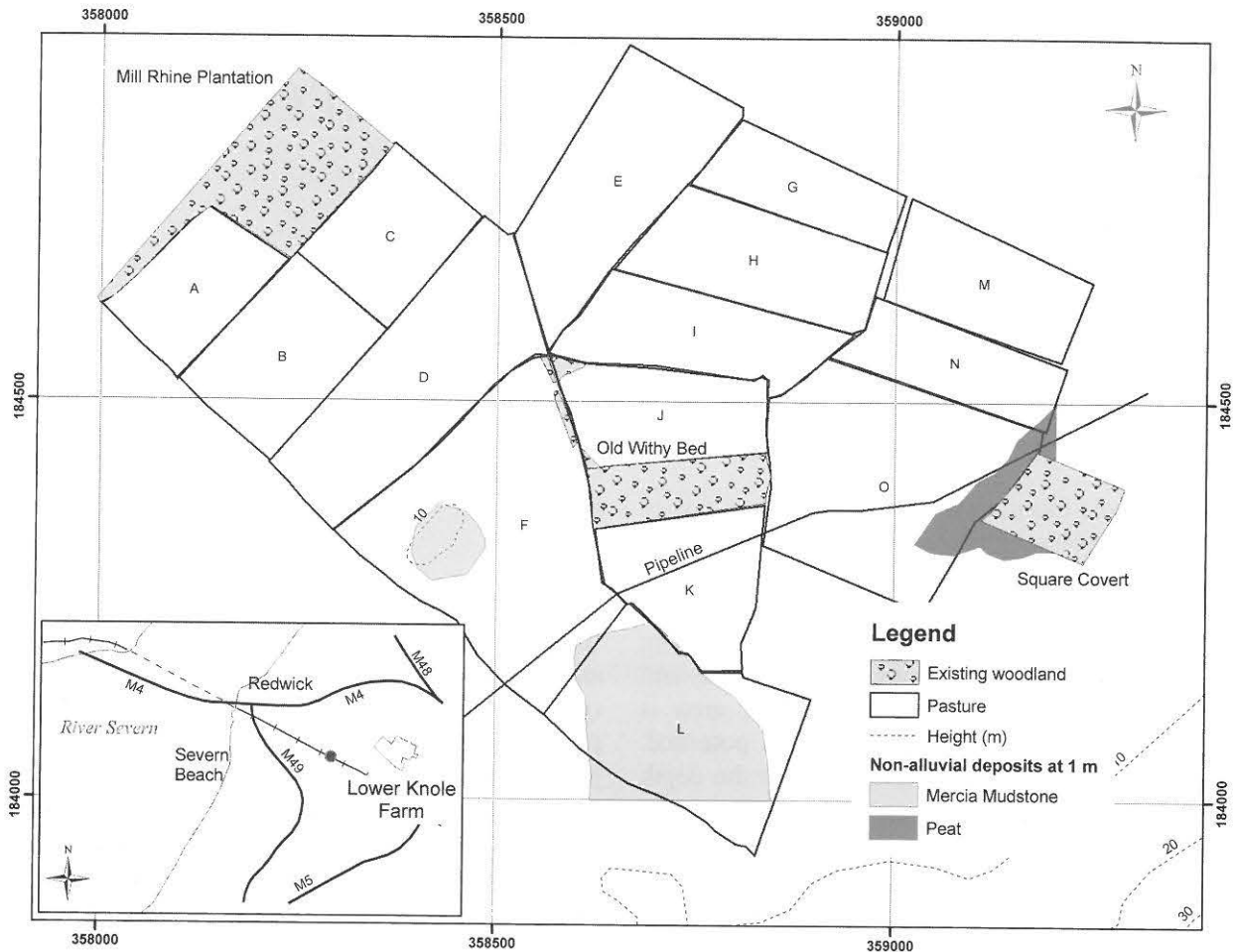


Figure 1. Location and plan of proposed woodland area at Lower Knole Farm. Based upon Ordnance Survey mapping. © Crown copyright – Forestry Commission Licence No: GD272388 2003

(Barker *et al* 2000). Resistivity imaging, Electromagnetics (EM) and magnetometry surveys (Fluxgate and Caesium vapour) were used in parts of field F to test for any palaeochannels and examine the area in which the Roman evidence had been previously found. The EM survey covered the whole field and identified both changes in the soil properties and underlying geology. The results from the auger survey allowed 'ground truthing' of the EM data, enabling more meaningful survey maps of the sub-surface changes to be produced for the whole field. Conversely, the magnetometer surveys were concentrated on the region of the previous Roman finds. However, as this was also where the gas pipeline had been installed, there was considerable interference. Some anomalies were nonetheless identified and investigated by excavation, as outlined below.

EXCAVATIONS

During a very wet November 2000, South Gloucestershire County Council commissioned five investigation trenches from Glamorgan-Gwent Archaeological Trust (GGAT). No archaeological evidence was found in the trench that crossed the small hill (Lawler 2000), but the close proximity of the Mercia Mudstone to the soil surface may have resulted in the loss of any evidence through plough damage. Evidence of Roman occupation was found in other trenches located near the southern end of field F. Finds were located at the base of the alluvial deposits close to the Mercia Mudstone and included domestic animal bones, local pottery, charcoal and stone. Lawler concluded that the site might have been the location of a simple Roman settlement,

on low-lying but predominantly dry land on the margins of a floodplain to the north which was intersected by minor streams and channels. This open, predominantly grass dominated, landscape has subsequently been supported by environmental analysis (pollen and diatom) of the profile sections sampled during the excavations (Walker *et al* 2002).

EXAMINATION OF EXISTING TREE ROOTS

Root examination trenches were dug in two of the existing areas of woodland to depths at which the water table was reached. In Mill Rhine Plantation, this was 1.2 m, while in Square Covert wood the water table was found at only 0.5 m. In the latter, the structural roots ran for up to 2 m from the trunk along the ground surface. Few tree roots can tolerate permanently waterlogged anaerobic conditions, so the roots in Square Covert were very shallow. Elsewhere on the site where the water table was deeper, fine roots from both trees and grass were recorded in some auger samples to a depth of 1.3 m.

WOODLAND ESTABLISHMENT

Following the survey and excavation results, a revised planting scheme was approved for the site. The area between the small hill and the archaeological finds to the south was incorporated into planned open space to be maintained as short grassland. Additionally, the area of field O closest to Square Covert wood where peat deposits are shallowest was also left unplanted. As the remaining site was found to consist of at least 1.7 m of late or post-Roman alluvium, the establishment of predominantly mixed broadleaf community woodland was approved.

Postscript - hydrological monitoring

The hydrology of the site was believed to be predominantly influenced by climate and field drainage. However, as a precautionary measure, the site offered an opportunity to monitor hydrological changes. Twelve months prior to

any tree planting, 24 dip wells were installed in three different areas of the farm. Each of the three sets, comprised four located in an existing woodland and four in an adjacent field. Since then, the depth of the water table in each well has been recorded fortnightly. In all of the open fields, trees have been planted and the monitoring is ongoing. This will allow any change in water table due to the establishment of the new woodland to be assessed, along with any other environmental factors. Results from this work will be published once the trees have become fully established on the site.

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