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UNIT GUIDE 2023-24

The Interaction of Soil Environments and Woody Plants

LO 7. Understand the importance of pre-planting soil surveys for woody plants

7. 1 Understand the importance of pre-planting soil surveys for woody plants

A soil survey is the systematic examination, description, classification, and mapping of soils in an area. Whether for residential or commercial development, highway construction, new schools, allotments, parks, sports fields, garden design, pipeline installation, or agricultural enhancement, soil resource surveys are performed to evaluate and quantify the soil resources on any development site.

Example of Construction Code of Practice for the Sustainable Use of Soils on Construction Sites can be found here:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/71651 0/pb13298-code-of-practice-090910.pdf

To learn more about the subsurface circumstances at a construction site, site investigations or sub-soil explorations are conducted. To determine the engineering qualities of soils, laboratory tests and in-situ testing procedures are used to collect soil samples, determine the profile of the site's natural soil deposits, and analyse the results.

https://theconstructor.org/geotechnical/site-investigation-soil-exploration/312/

Fig 1: Topographical Study of Site

Fig 2: Collecting Soil Sample for Preliminary Soil Exploration

Fig 3: Detailed Site Exploration

Soil surveys can be classified as either detailed, reconnaissance, or detailed reconnaissance.
There are three main parts of a soil survey:

Detailed Soil Survey:
Based on observations gathered across a surveyed area, soil boundaries are correctly depicted on maps. The information provided by thorough soil surveys is crucial for planning land use and management.

In a reconnaissance survey, soil boundaries are defined based on repeated measurements.

Detailed Reconnaissance Survey: combining the reconnaissance and detailed

Applying the concepts of soil science makes extensive use of geomorphology, theories of soil formation, physical geography, and patterns of plant and land use.

Basically, soil surveys could include:

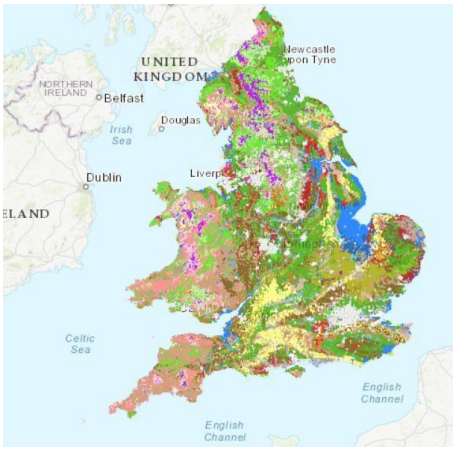
- soil maps identifying different soil types;
- site observations, photographs, and soil descriptions;
- results and interpretation of all laboratory analyses;
- discussion on soil quality, quantity, variability, and suitability for the proposed landscape scheme (tree pits, ornamental shrubs, native woodland, amenity grass, species-rich grassland, wetlands);
- advice on the re-use of surplus soils, including compliance with industry standards for off-site sale and re-use (e.g. BS3882:2015 and BS8601:2013);
- recommendations for soil handling and soil amelioration;

How to conduct a soil survey:

A survey will typically involve the use of hand-held sample equipment such as hand augers, and trial pits may be required for some investigations. Repeated soil samples are collected across the site, and the features of each layer (for example, colour, texture, drainage details, topsoil/subsoil) are recorded. Representative soil samples will also be analysed to characterise various soil materials, such as pH, particle size, organic matter, possible pollutants, and so on.

A soil survey is important because it:

- Provide full descriptions of the various soil types, including thickness and surface and subsurface layer characteristics within each type, as well as the findings of lab analyses (where required for landscaping or off-site resource movement).
- Determine the suitability of various soil resources for reuse on or off-site.
- Provide site-specific guidance on best practises for soil handling, management, and reinstatement, including soil damage rehabilitation.



UK Soil Observatory
https://mapapps2.bgs.ac.uk/ukso/home.html?layer=NSRISoilscapes
Soilscapes is a 1:250 000 scale, simplified soils dataset covering England and Wales.

https://extensionaus.com.au/irrigatingag/soil-survey-vs-soil-sampling/
https://www.designingbuildings.co.uk/wiki/Soil_survey#:~:text=Typically%2C%20a%20survey%20will%20involve,details%2C%20t opsoil%2Fsubsoil).

7.2. List **four** advantages of undertaking a soil survey prior to planting woody plants

Benefit 1: Money Saver

A soil survey saves money. If the appropriate trees are planted in the appropriate locations, a woodland will flourish. It is inevitable that some young trees will perish, but the numbers can be minimised by selecting tree species that will flourish in that region's soil. This can entail planting Italian alder on contaminated ground or willow and alder in moist places. This will lessen the amount of expensive remediation work, such as more drainage or irrigation, that is required.

Benefit 2: Accessing grant funding

To promote healthy tree development and sustainable forests, the UKFS* outlines the significance of effective soil management in forests and how it should be carried out. By addressing the issues that are most crucial for forest soils—acidification, pollution, compaction, disturbance, erosion, fertility, and organic matter—all forest and woodland managers must adhere to the UKFS.

Plans for managing soil resources and soil resource surveys are increasingly frequently required for obtaining planning clearance on development sites. They display the locations, varieties, and properties of the topsoil and subsoil that exist on the property and offer guidance on best practises for resource protection and suitability for reuse when disturbed land is being used. To get the most out of the thorough information, a soil survey is best carried out early on in a development project. A Woodland establishment Design Plan is a requirement for the UK Government's grant for the establishment of new woodlands. A site soil survey is recommended. 2*

Benefit 3: Ability to effectively plan

Because all soil types in the UK have been mapped (by the UK Soil Observatory), related locations can be identified based on the soil characteristics of a given area. Which trees will thrive on the landowner's

property will be determined by an analysis of the trees currently growing there. Planning the area's planting according to the soil study will provide a thorough picture that can be shared with potential land owners. The planting of woodlands may be phased in as funding becomes available, if necessary.

Benefit 4: Monitoring the results of planting

The fight against the climate problem is one of the many reasons to plant a woodland. A baseline of soil health and carbon sequestration can be obtained from a soil survey before planting. To gauge the effect of tree planting, soil sample studies can be repeated throughout time. To remediate a contaminated region, woods may also be planted (phytoremediation). The effect of the trees over time can be determined by repeated testing for heavy metals and other contaminants.

https://rfs.org.uk/events/an-introduction-to-soil-identification-for-foresters/

Sources

(1*Management a woodland or forest must follow the UKFS standards and policies.
The delivery of policy in all four nations is supported by the UK Forestry Standard (UKFS), which is the technical standard for sustainable forestry practise in England, Scotland, Wales, and Northern Ireland. The fourth edition, which was released in 2017, was first published in 1998. It offers a framework for implementing sustainable forest management in the UK and is based on internationally recognised standards. Sustainable forest management is a broad term that encompasses the environmental, economic, and social elements of forestry.)
2* https://www.gov.uk/guidance/woodland-creation-planning-grant (WCPG_-_WCDP_Template_v7-)