

National Soil Resources Institute

Cranfield
UNIVERSITY

Soils Site Report

Undergraduate Student Report

elwick

National Grid Reference: NZ4569132516

Easting: 445691

Northing: 532516

Site Area: 2km x 2km



Prepared by
authorised user:

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Northumbria University

19 October 2012

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Admissions officer, School of Applied Sciences

Phone: +44 (0) 1234 754086 Email: appliedsciences@cranfield.ac.uk

Citations

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About this report

This Soils Site Report aims to support the teaching of soil science at undergraduate (BSc, NVQ etc.) or equivalent level. If you are a researcher, we suggest you contact us for access to more comprehensive Soils Site Reports and their underlying data.

This Soils Site Report identifies and describes the properties and capacities of the soil at your specified location as recorded in the National Soil Map for England and Wales. It has been produced by Cranfield University's National Soil Resources Institute. www.cranfield.ac.uk/sas

The National Soil Map represents the most accurate comprehensive source of information about the soil at the national coverage in England and Wales. It maps the distribution of soil mapping units (termed soil associations) which are defined in terms of the main soil types (or soil series) that were recorded for each soil association during field soil survey. Each soil association is named after its principal soil series and these bear the location name from where they were first described (e.g. Windsor). Each of these soil associations have differing environmental characteristics (physical, chemical and biological) and it is by mapping these properties that the range of thematic maps in this report have been produced.

Soil types and properties vary locally, as well as at the landscape scale. It is not possible to identify precisely the soil conditions at a specific location without first making a site visit. We have therefore provided you with information about the range of soil types we have identified at and around your selected location. Schematic diagrams are also provided to aid accurate identification of the soil series at your site.

Whilst an eight-figure national grid reference should be accurate to within 100m, a single rural Postcode can cover a relatively large geographical area. Postcodes can therefore be a less precise basis for specifying a location. The maps indicate the bounded area the reports relate to.

Your Site Soil Report will enable you to:

- identify the soils most likely to be present at and immediately around your specified location;
- understand the patterns of soil variation around your location and how these correlate with changes in landscape;
- identify the nature and properties of each soil type present within the area;
- understand the relevant capacities and limitations of each of the soils and how these might impact on a range of factors such as surface water quality.

Provided that this Soils Site Report is not modified in any way and it is used in the context of your undergraduate course work, you may reproduce it for a third-party.

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- c. Comprising Soil Series
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REFERENCES

1. SOIL THEMATIC MAPS

This section contains a series of maps of the area surrounding your selected location, presenting a number of thematic maps relating to the characteristics of the soils. These provide an overview of the nature and condition of the local soil conditions. It is these conditions that may be used to infer the response of an area to certain events (with the soil as a receptor), such as pollution contamination from a chemical spill, or an inappropriate pesticide application and the likelihood of these materials passing through the soil to groundwater. Other assessments provide an insight into the way a location may impact, by corrosive attack or ground movement, upon structures or assets within the ground, for example building or engineering foundations or pipes and street furniture.

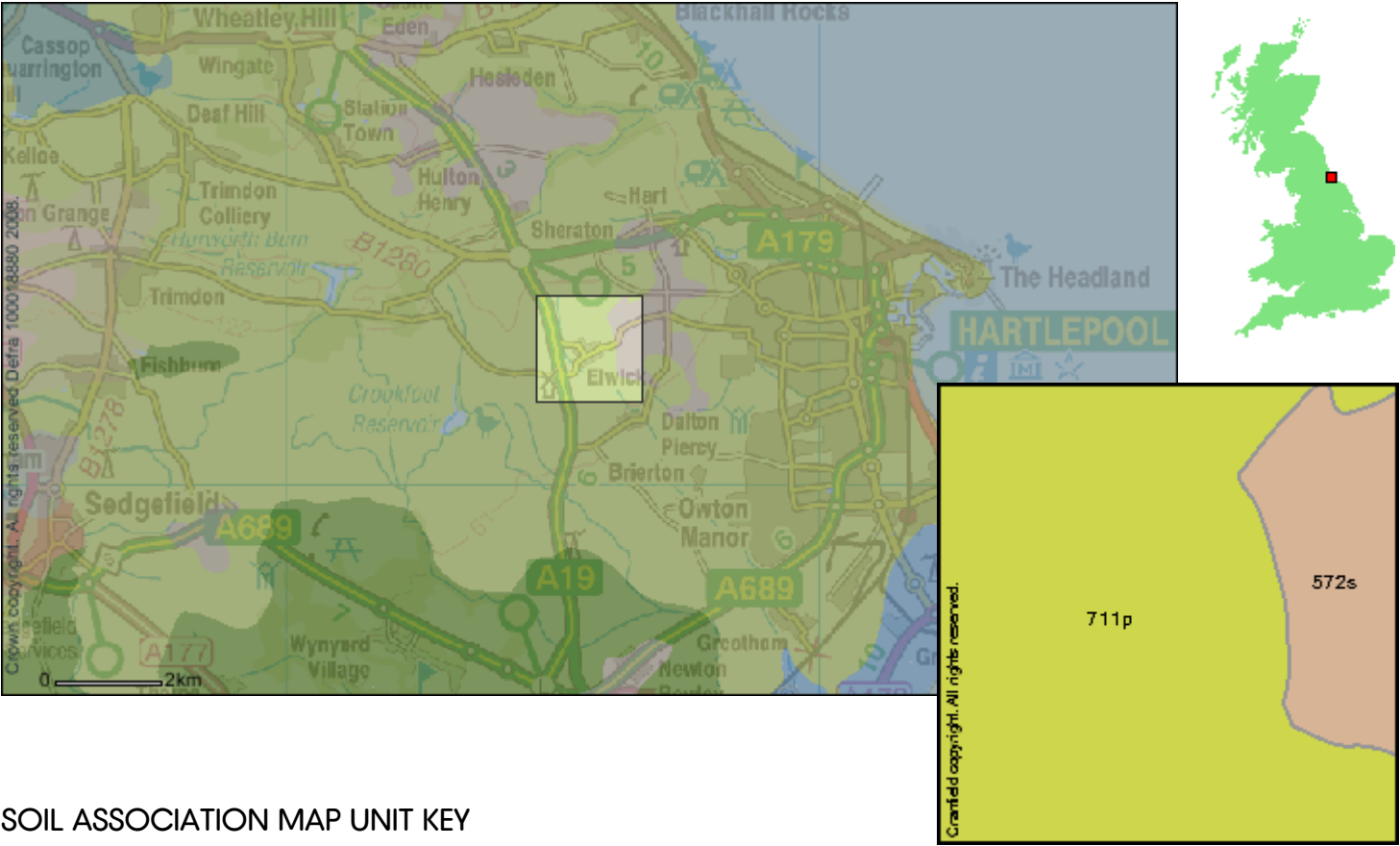
Soil is a dynamic environment with many intersecting processes, chemical, physical and biological at play. Even soils 'sealed' over by concrete and bitumen are not completely dormant. The way soils respond to events and actions can vary considerably according to the properties of the soil as well as other related factors such as land-use, vegetation, topography and climate. There are many threats facing our national soil resource today and forthcoming legislation such as the proposed Soil Framework Directive (SFD) (COM(2006) 232) will seek to identify measures aimed towards soil protection and ensuring the usage of soils in the most sustainable way. This report is therefore a useful snapshot of the soil properties for your given area, providing a summary of a broad range of ground conditions.

To learn more about the soil system, the functions and ecosystems services performed by soil as well as the range of pressing contemporary threats and concerns for soils in the UK and world-wide, visit our free educational web resources:

Soil-net www.soil-net.com

SoilsWorldwide www.soilsworldwide.net

1a. SOILS - SPATIAL DISTRIBUTION

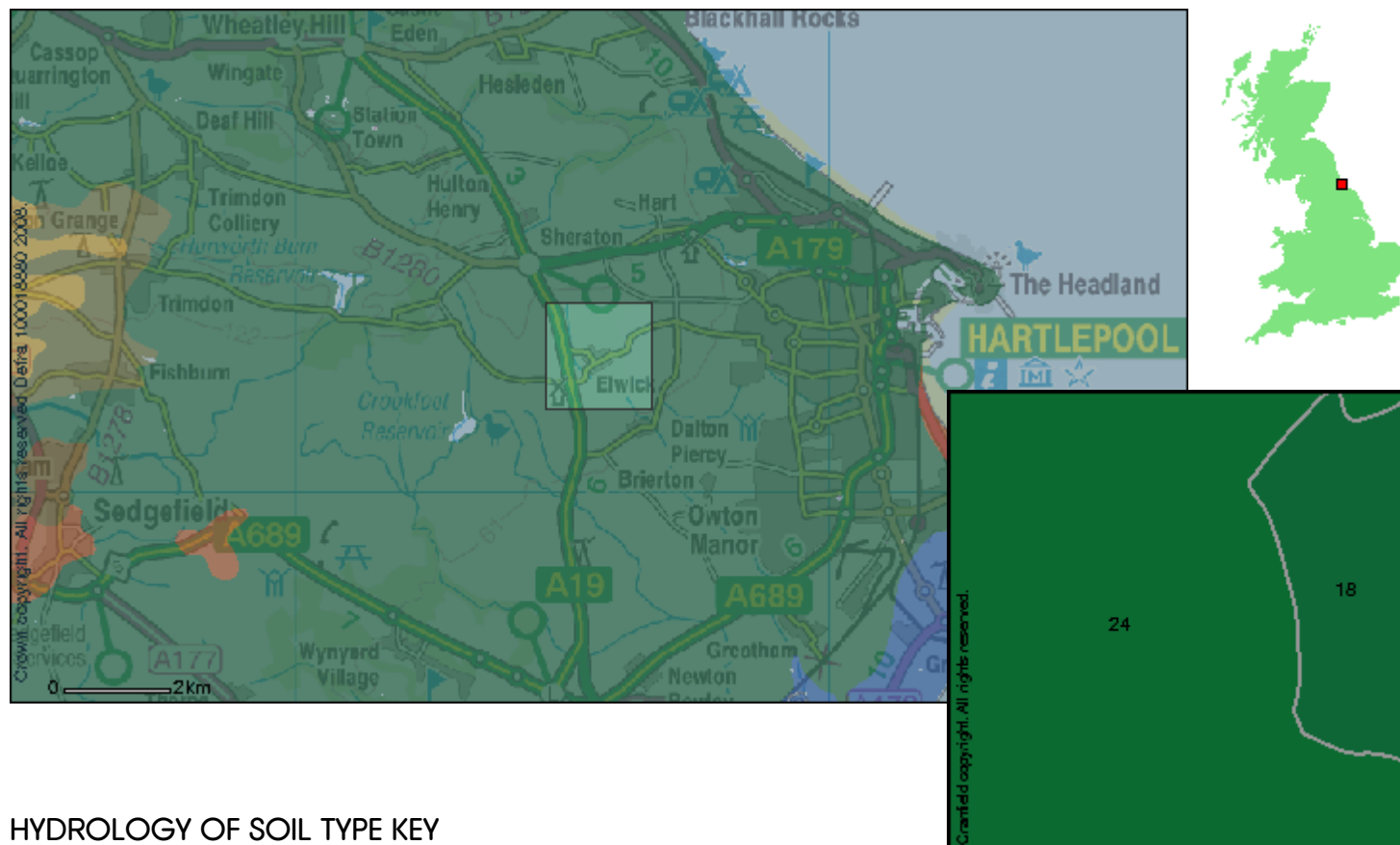


SOIL ASSOCIATION MAP UNIT KEY

- Bishampton 1 572s**
Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging
- DUNKESWICK 711p**
Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils

Soil associations represent a group of soil series (soil types) which are typically found occurring together, associated in the landscape (Avery, 1973; 1980; Clayden and Hollis, 1984). Soil associations may occur in many geographical locations around the country where the environmental conditions are comparable. For each of these soil associations, a collection of soil types (or soil series) are recorded together with their approximate proportions within the association. Soil associations have codes as well as textual names, thus code '554a' refers to the 'Frilford' association. Where a code is prefixed with 'U', the area is predominantly urbanised (e.g. 'U571v'). The soil associations for your location, as mapped above, are described in more detail in Section 2: Soil Association Descriptions.

1b. HYDROLOGY OF SOIL TYPE (HOST)



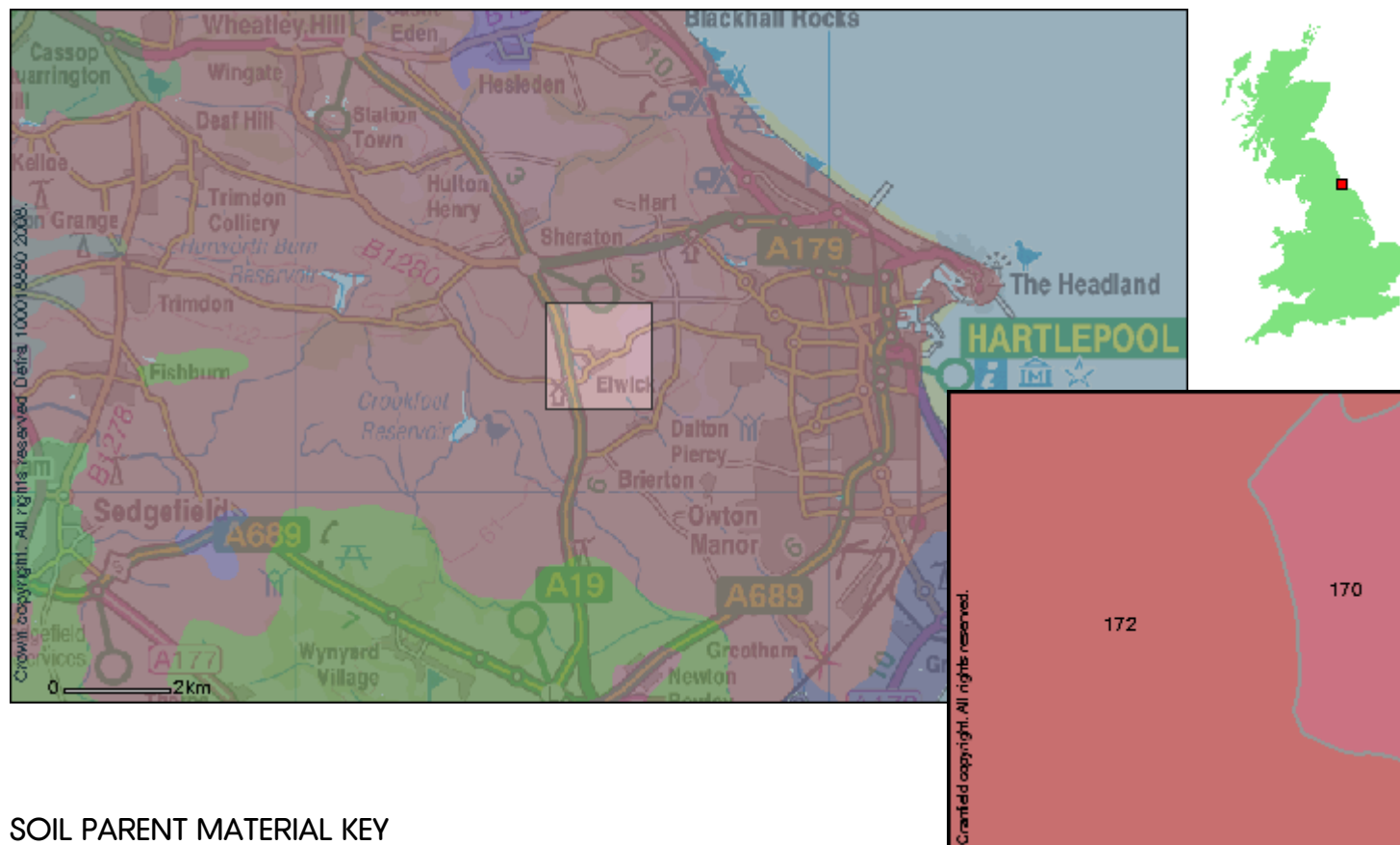
HYDROLOGY OF SOIL TYPE KEY

- 18 - Slowly permeable soils with slight seasonal waterlogging and moderate storage capacity over slowly permeable substrates with negligible storage
- 24 - Slowly permeable, seasonally waterlogged soils over slowly permeable substrates with negligible storage capacity

HOST CLASS DESCRIPTION

The Hydrology of Soil Types (HOST) classification describes the dominant pathways of water movement through the soil and, where appropriate, the underlying substrate. Eleven drainage models are defined according to the permeability of the soil and its substrate and the depth to a groundwater table, where one is present (Boorman et al, 1995). These are further subdivided into 29 HOST classes to which all soil series have been assigned. These classes identify the way soil water flows are partitioned, with water passing over, laterally through, or vertically down the soil column. Analysis of the river hydrograph and the extent of soil series for several hundred gauged catchments allowed mean values for catchment hydrological variables to be identified for each HOST class. The HOST classification is widely used to predict river flows and the frequency and severity of flood events and also to model the behaviour of diffuse pollutants (Hollis et al, 1995).

1c. SOIL PARENT MATERIAL



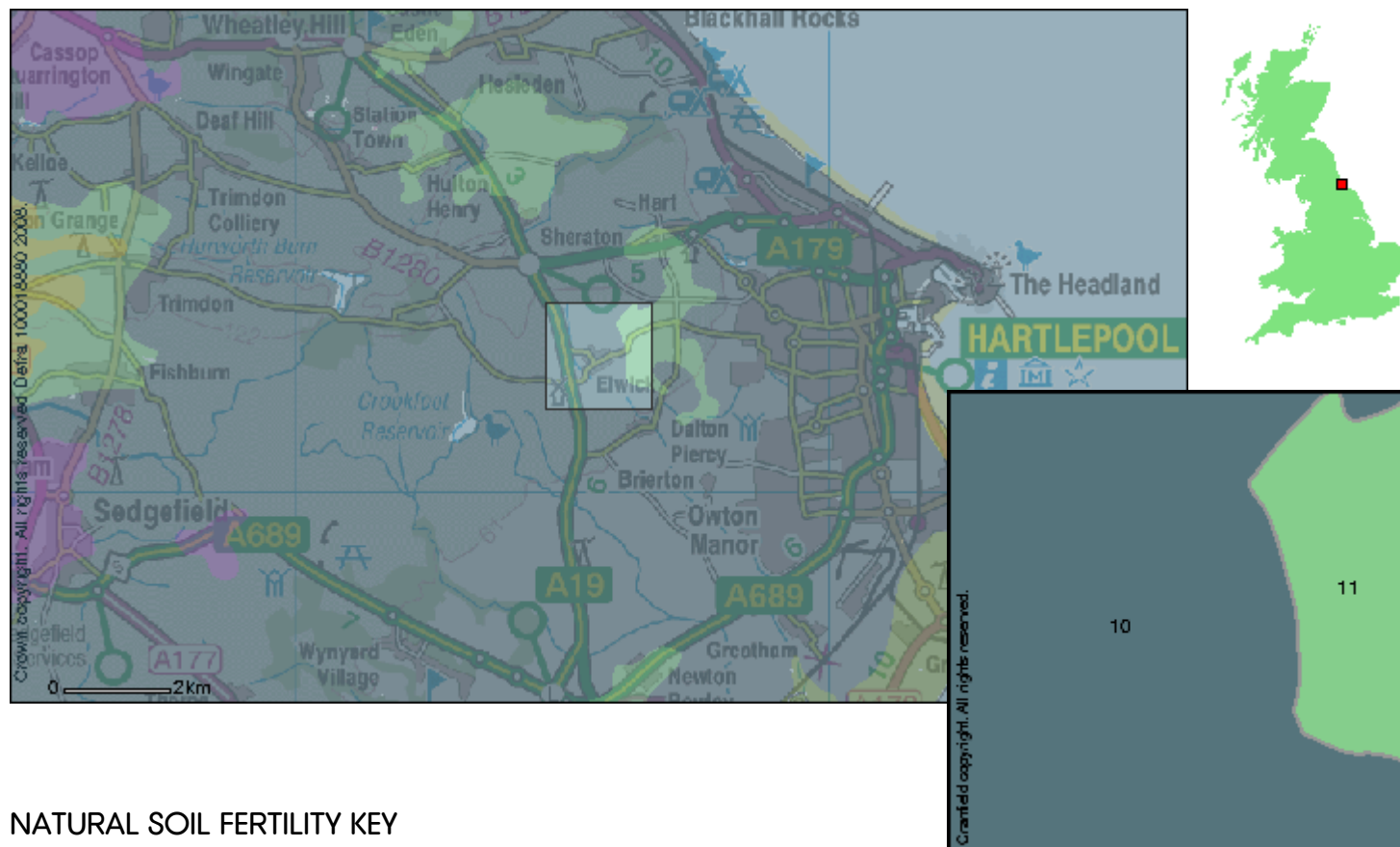
SOIL PARENT MATERIAL KEY

- 170 - Till and glaciofluvial drift
- 172 - Till from Palaeozoic and Mesozoic sandstone and shale

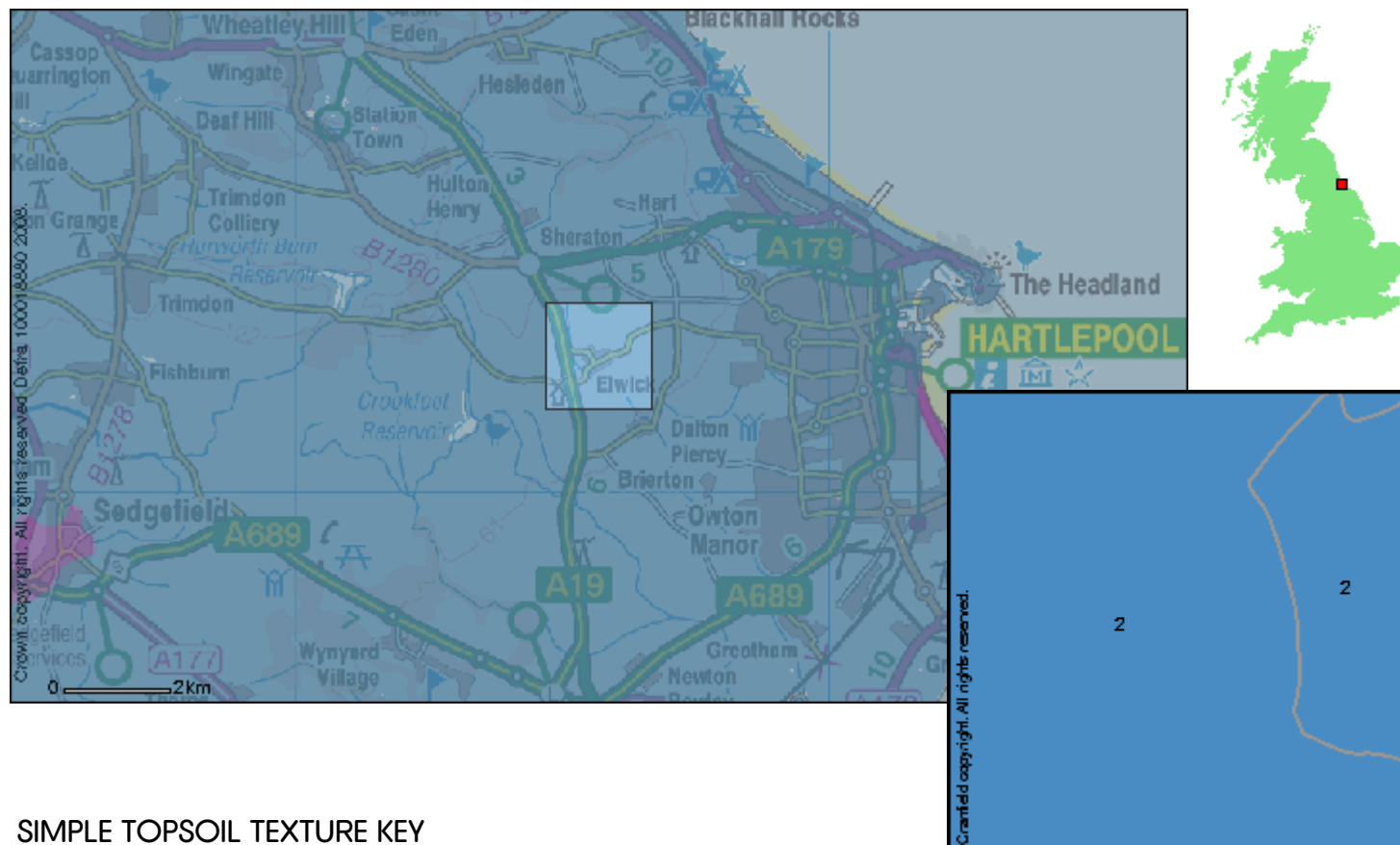
SOIL PARENT MATERIAL DESCRIPTION

Along with the effects of climate, relief, organisms and time, the underlying geology or 'parent material' has a very strong influence on the development of the soils of England and Wales. Through weathering, rocks contribute inorganic mineral grains to the soils and thus exhibit control on the soil texture. During the course of the creation of the national soil map, soil surveyors noted the parent material underlying each soil in England and Wales. It is these general descriptions of the regional geology which is provided in this map.

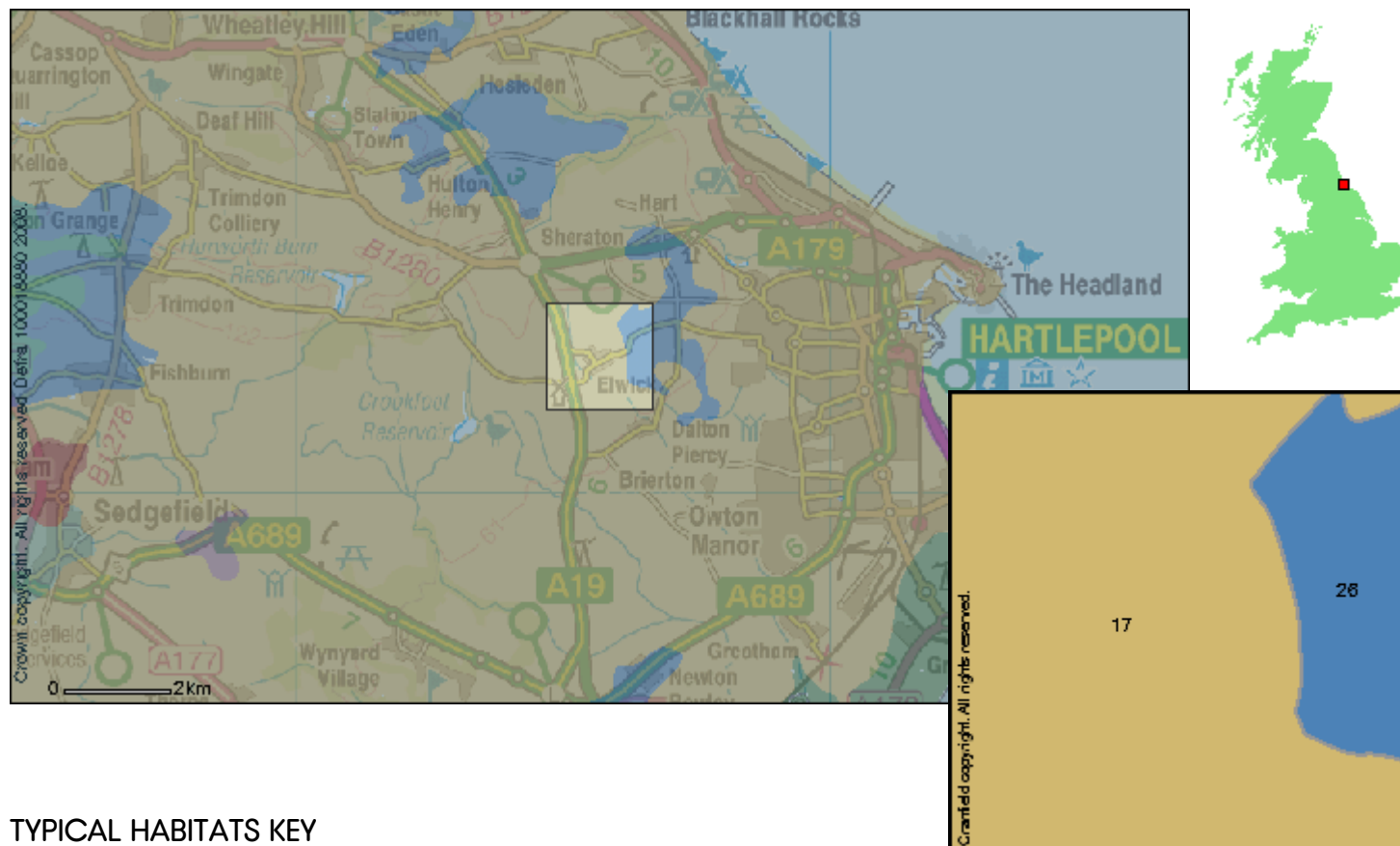
1d. NATURAL SOIL FERTILITY



1e. SIMPLE TOPSOIL TEXTURE



1f. TYPICAL HABITATS



TYPICAL HABITATS KEY

- 17 - Seasonally wet pastures and woodlands
- 26 - Wide range of pasture and woodland types

TYPICAL HABITATS DESCRIPTION

There is a close relationship between vegetation and the underlying soil. Information about the types of broad habitat associated with each soil type is provided in this map. Soil fertility, pH, drainage and texture are important factors in determining the types of habitats which can be established. Elevation above sea level and sometimes even the aspect - the orientation of a hillslope - can affect the species present. This map does not take into account the recent land management or any urban development, but provides the likely natural habitats assuming good management has been carried out.

1g. HYDROGEOLOGICAL ROCK TYPE



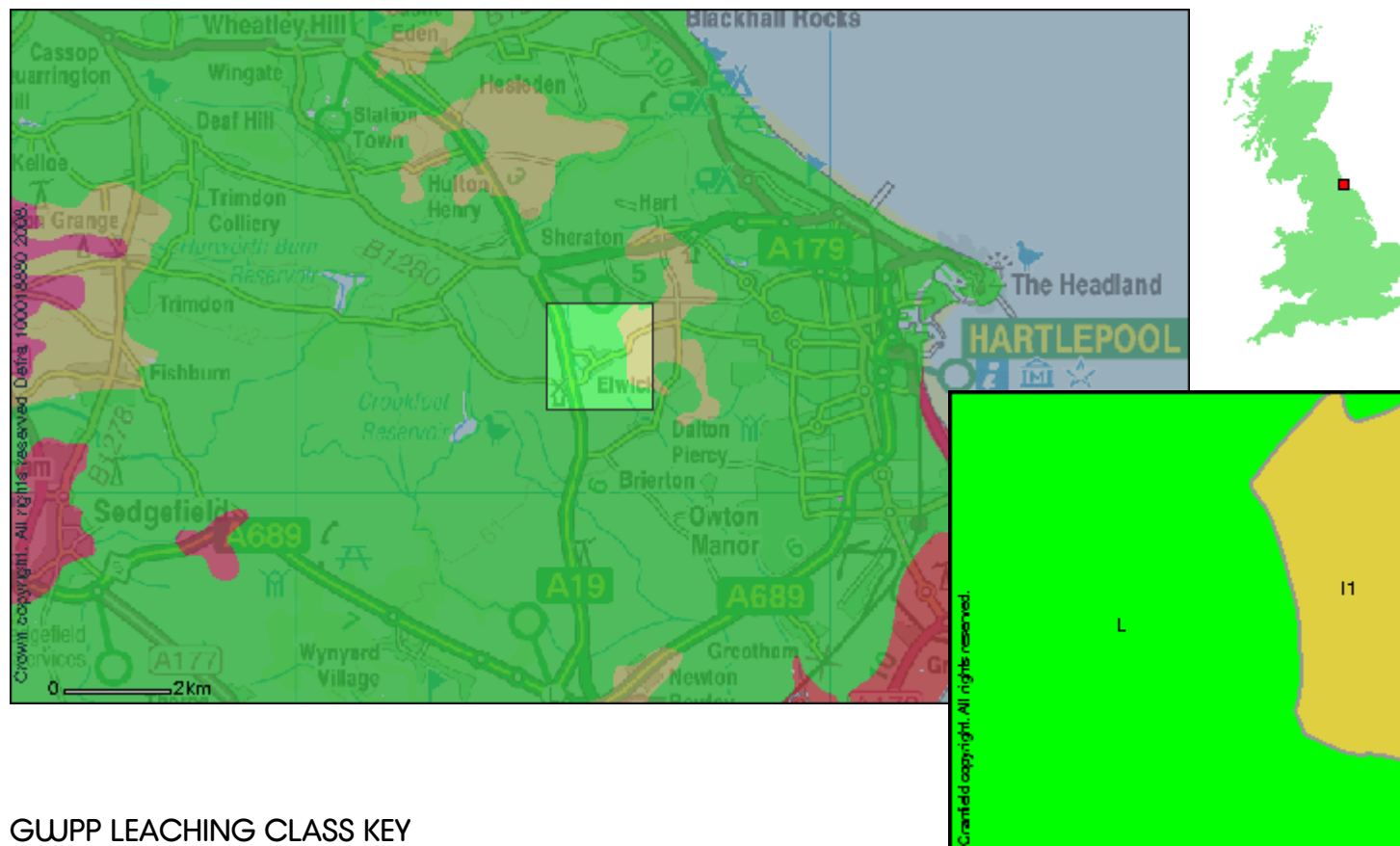
HYDROGEOLOGICAL ROCK TYPE KEY

22 - till and compact Head

HYDROGEOLOGICAL ROCK TYPE DESCRIPTION

The hydrogeological classification of the soil parent materials provides a framework for distinguishing between soil substrates according to their general permeability and whether they are likely to overlie an aquifer. Every soil series has been assigned one of the 32 substrate classes and each of these is characterised according to its permeability (being characterised as permeable, slowly permeable or impermeable). For further information, see Boorman et al (1995).

1h. GROUND WATER PROTECTION POLICY (GUWPP) LEACHING



GUWPP LEACHING CLASS KEY


- I1 - Soils of intermediate leaching potential which have a moderate ability to attenuate a wide range of diffuse source pollutants but in which it is possible that some non-adsorbed diffuse source pollutants and liquid discharges could penetrate the soil layer
- L - Soils in which pollutants are unlikely to penetrate the soil layer either because water movement is largely horizontal or because they have a large ability to attenuate diffuse source pollutants


GUWPP LEACHING CLASS DESCRIPTION

The Ground Water Protection Policy classes describe the leaching potential of pollutants through the soil (Hollis, 1991; Palmer et al, 1995). The likelihood of pollutants reaching ground water is described. Different classes of pollutants are described, including liquid discharges adsorbed and non-adsorbed pollutants.

2. SOIL ASSOCIATION DESCRIPTIONS

The following pages describe the following soil map units, (soil associations), in more detail.

 **Bishampton 1 572s**
Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging

 **DUNKESWICK 711p**
Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils

The soil associations are described in terms of their texture and drainage properties and potential risks may be identified. The distribution of the soils across England and Wales are provided. Further to this, properties of each association's component soil series are described in relation to each other. Lastly, schematic diagrams of each component series are provided for greater understanding and in-field verification purposes.

Bishampton 1 (572s)*Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging***a. General Description**

Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging associated with well drained fine and coarse loamy soils in an undulating landscape. Some slowly permeable seasonally waterlogged fine loamy soils.

The major landuse on this association is defined as cereals and short term grassland; stock rearing on permanent grassland in the northern region.

b. Distribution (England & Wales)

The Bishampton 1 association covers 240km² of England and Wales which accounts for 0.16% of the landmass. The distribution of this association is shown in Figure 1. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the Bishampton 1 association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occurring in your site in Table 1.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

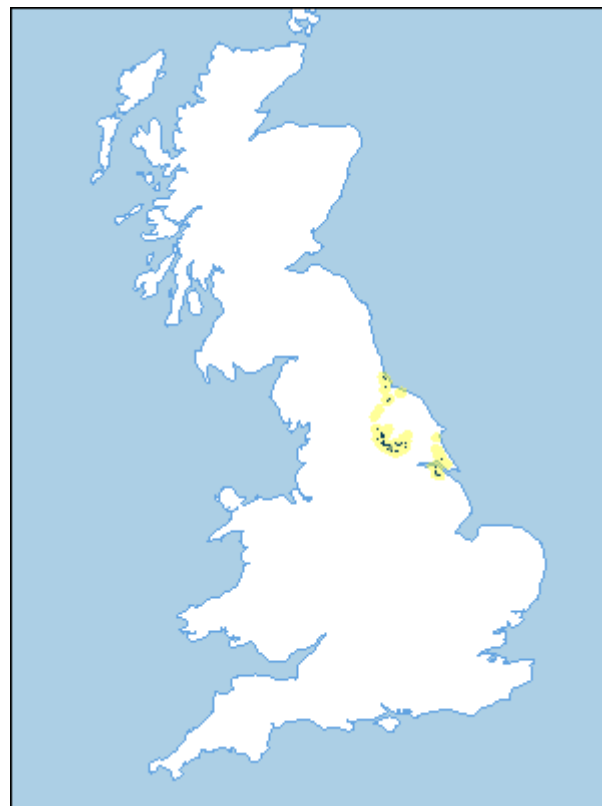
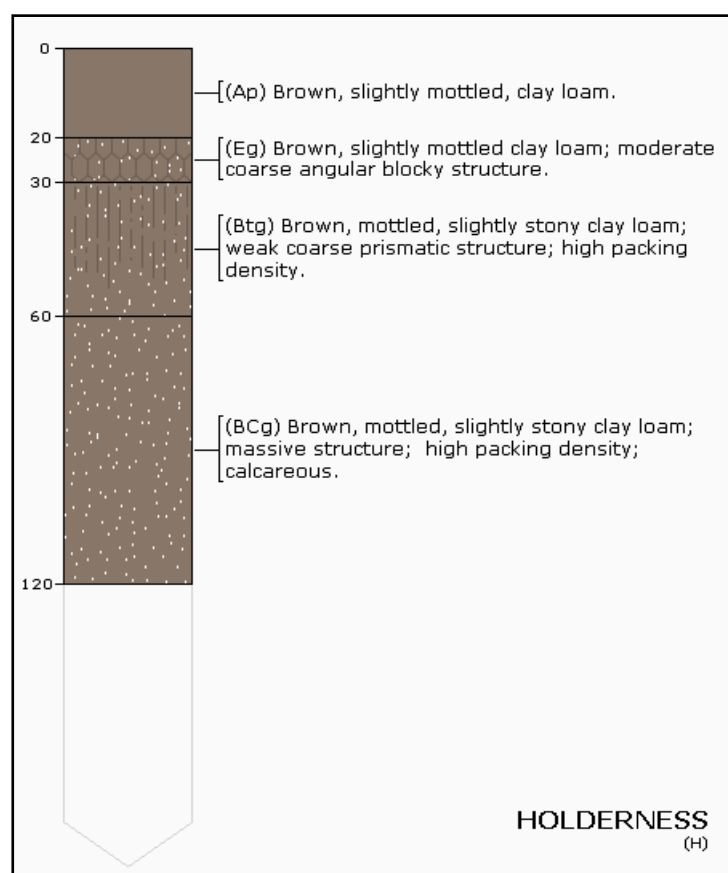
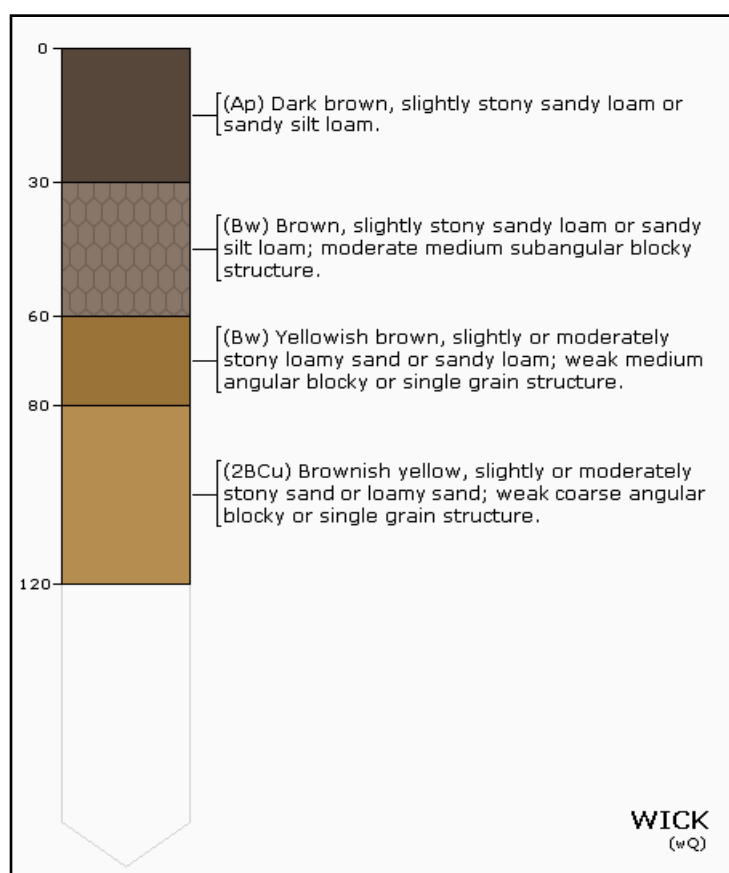
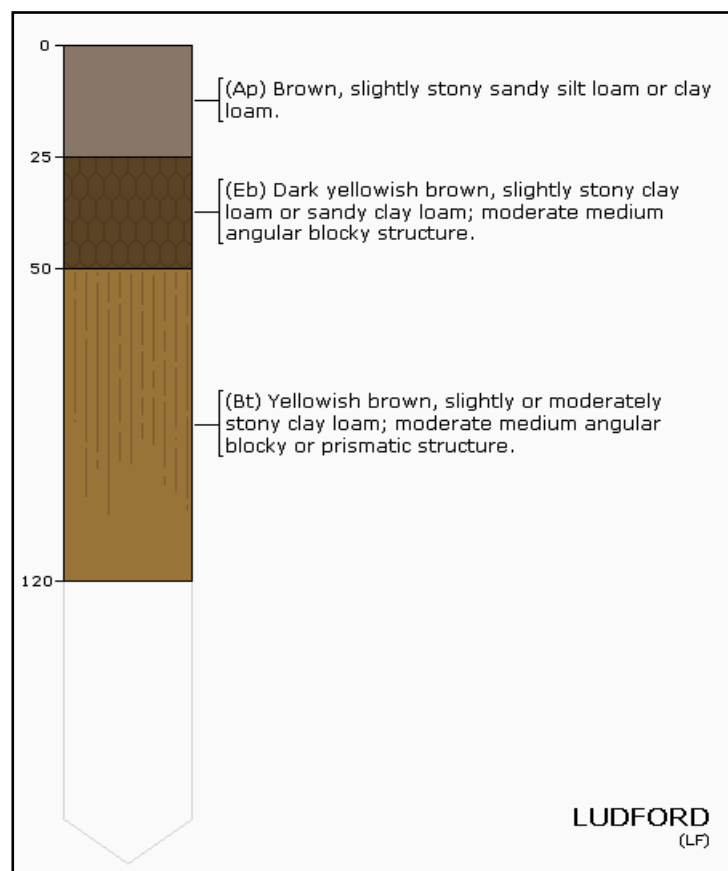
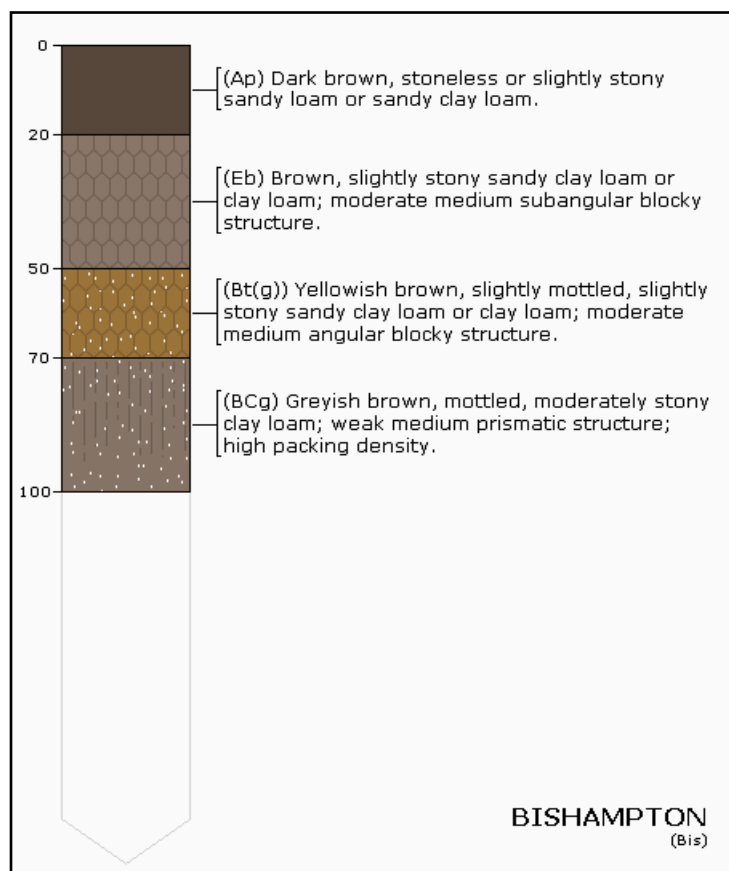


Figure 1. Association Distribution

Soil Series	Description	Area %
BISHAMPTON (Bis)	medium loamy drift with siliceous stones	35%
LUDFORD (LF)	medium loamy drift with siliceous stones	25%
WICK (wQ)	light loamy drift with siliceous stones	20%
HOLDERNESS (H)	medium loamy chalky drift	15%
OTHER	other minor soils	5%

Table 1. The component soil series of the Bishampton 1 soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

Bishampton 1 (572s)*Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging***d. Bishampton 1 Component Series Profiles**

DUNKESWICK (711p)
Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils

a. General Description

Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils associated with similar clayey soils.
The major landuse on this association is defined as grassland in moist lowlands, some arable cropping in drier lowlands.

b. Distribution (England & Wales)

The DUNKESWICK association covers 3002km² of England and Wales which accounts for 1.99% of the landmass. The distribution of this association is shown in Figure 14. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the DUNKESWICK association are outlined in Table 2 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 2.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

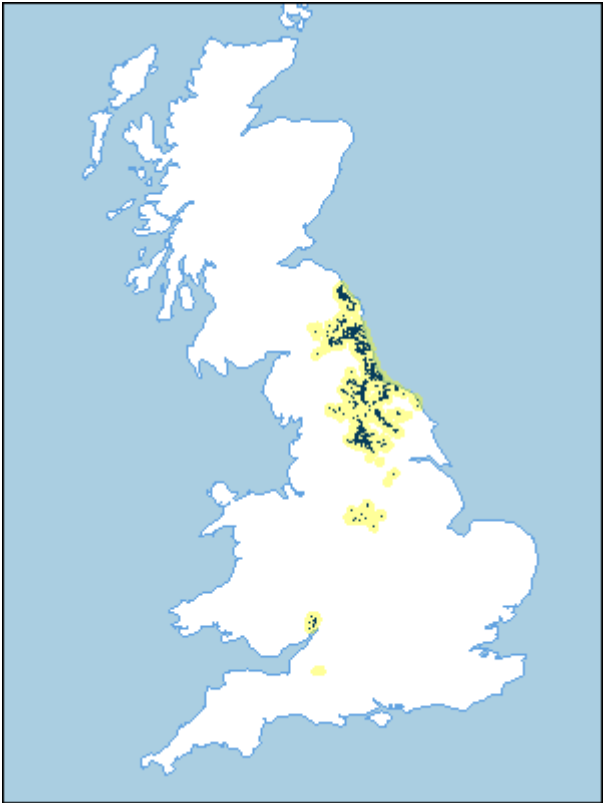


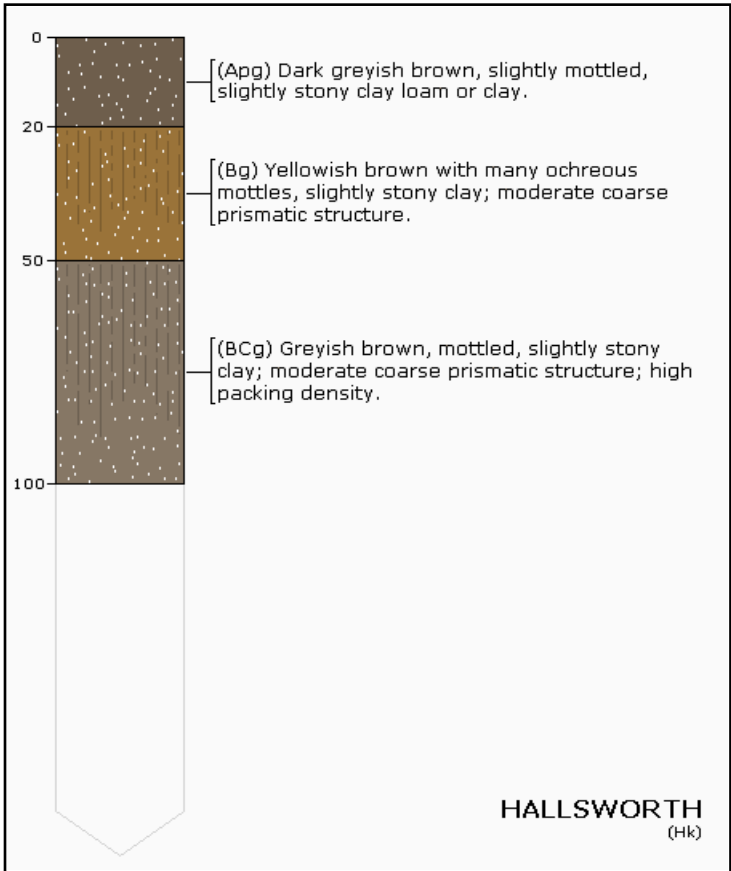
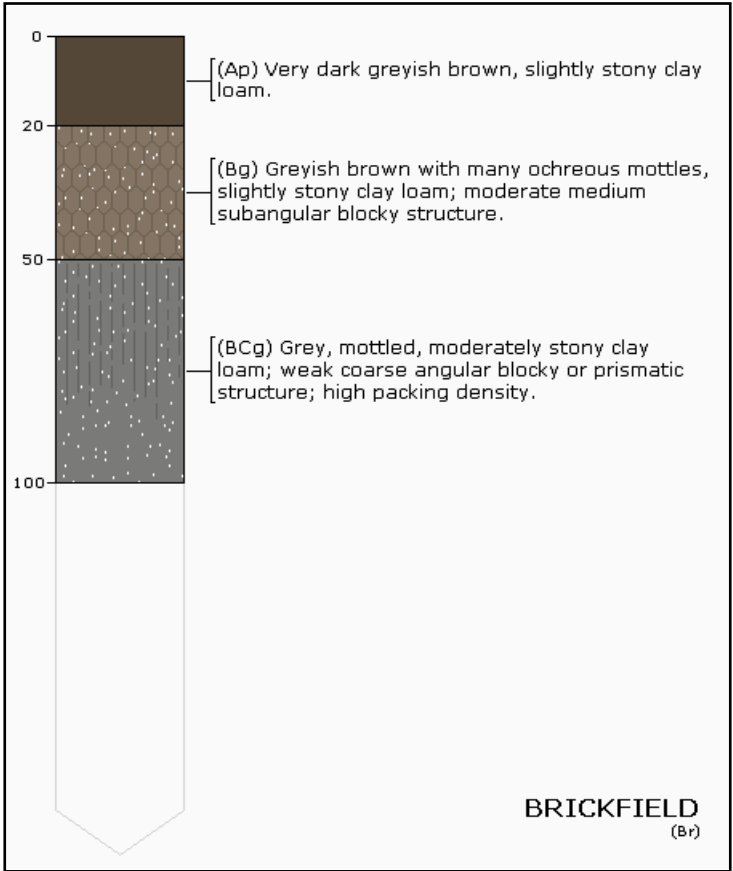
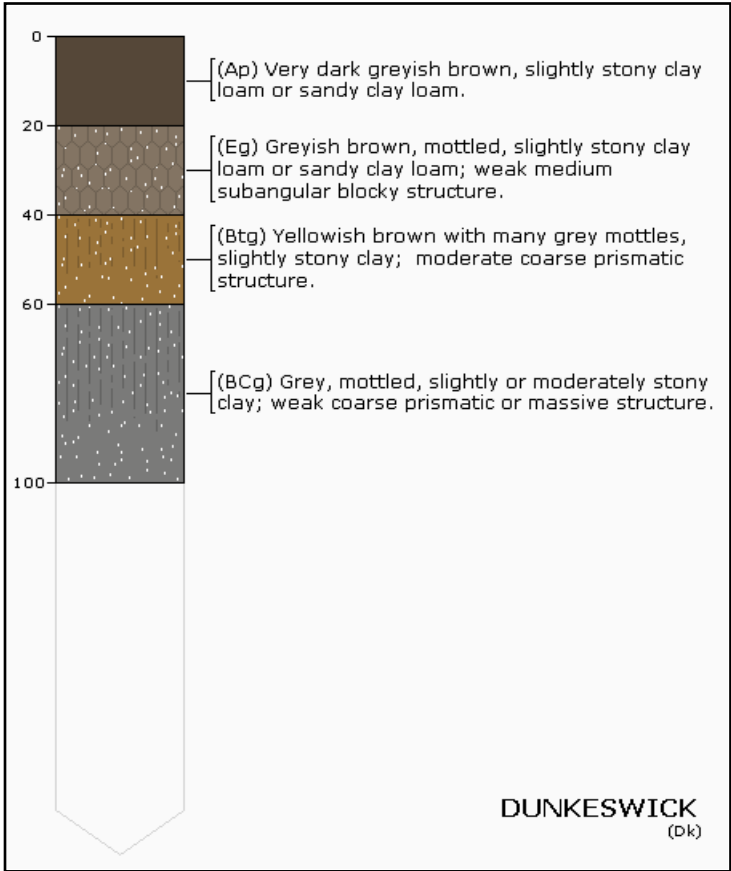
Figure 14. Association Distribution

Soil Series	Description	Area %
DUNKESWICK (Dk)	medium loamy over clayey drift with siliceous stones	55%
BRICKFIELD (Br)	medium loamy drift with siliceous stones	25%
HALLSWORTH (Hk)	clayey drift with siliceous stones	10%
OTHER	other minor soils	10%

Table 2. The component soil series of the DUNKESWICK soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

DUNKESWICK (711p)
Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils

d. DUNKESWICK Component Series Profiles



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