DEVON STRUCTURE PLAN: MOUNT HOWE, TOPSHAM, EXETER

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in the preparation of the Devon Structure Plan. The fieldwork at Mount Howe, Topsham, was completed in July and November 1994 at a scale of 1:10,000. Data on climate, soils, geology and from previous Agricultural Land Classification (ALC) Surveys was used and is presented in the report. The distribution of grades is shown on the accompanying ALC map and summarised below. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Mount Howe, Topsham

Grade	Area (ha)	%of Survey Area	%of Agricultural Land	
2	10.7	24.4	34.7	
3b	20.1	45.8	65.3	
Urban	4.4	10.0	0.0	
Non Agricultural	5.7	13.0	0.0	
Open Water	3.0	6.8	0.0	
TOTAL	43.9	100.0	100.0	(30.8 ha)

The majority of the site has been mapped as Subgrade 3b. This low lying area shows evidence of prolonged waterlogging and has heavy textured soils. The higher land is better drained but slightly stony and experiences a droughtiness limitation restricting the land to Grade 2. A small area of the higher land is very stony and steep.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in July and November 1994 at Mount Howe, Topsham, Exeter, on behalf of MAFF as part of its statutory role in the preparation of the Devon Structure Plan. The fieldwork covering 44 ha of land was conducted by ADAS at a scale of 1:10,000 with approximately one boring per hectare of agricultural land. A total of 28 auger borings were examined and three soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1972) shows the lower lying land to be Grade 4 and the higher land to be Grade 1. A small area of urban is mapped in the west.

The recent survey supersedes this map having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

2. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall climate are accumulated temperature, a measure of the relative warmth of a locality, and average annual rainfall, a measure of overall wetness. The results shown in Table 1 indicate there is no overall climatic limitation.

Table 1: Climatic Interpolations: Mount Howe, Topsham

Grid Reference		SX 970 876
Altitude (m)		15
Accumulated Temperature (day ºC)		1584
Average Annual Rainfall (mm)		819
Overall Climatic Grade		1
Field Capacity Days		172
Moisture deficit (mm):	Wheat	111
	Potatoes	106

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

3. RELIEF AND LAN DCOVER

The eastern half of the site is flat and low lying (2 m AOD) protected from the River Clyst by embankments. The land to the west rises steeply in places, to an altitude of 15 m AOD. All of the agricultural land at the time of survey was in permanent grass. There were also areas of derelict agricultural land which have scrubbed over in the west.

The geology of the site is shown on the published 1:50,000 scale drift geology map, sheet 325 (Institute of Geological Sciences 1971).

This shows the land in the east has alluvium deposits. Where the altitude increases to the west the site is underlain with Lower Sandstone and on the very highest ground there are valley gravels. Around the low-lying edges of the site exist mud deposits.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000.

This shows that the site is divided between soils of the Wallasea 1 Association in the east and Newnham Association soils in the west. Wallasea 1 soils are described as deep stoneless non-calcareous and calcareous clayey soils. Groundwater is controlled by ditches and pumps. Newnham soils are described as well drained reddish coarse and fine loamy soils over gravel which may be locally deep.

The soils found during the recent survey were typical of the mapped Associations. The low-lying land has clayey soils severely affected by groundwater, whilst the higher land has stony sandy loam soils.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 2: Distribution of ALC grades: Mount Howe, Topsham

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
2	10.7	24.4	34.7	
3b	20.1	45.8	65.3	
Urban	4.4	10.0	0.0	
Non Agricultural	5.7	13.0	0.0	
Open Water	3.0	6.8	0.0	
TOTAL	43.9	100.0	100.0	(30.8 ha)

Grade 2

An area of Grade 2 has been mapped on the higher land in the western side of the site. These soils are well drained and are assessed Wetness Class I (see Appendix 3). The medium sandy loam soils have 5% hard stones in the topsoil which increases to 15% in the upper subsoil and then decreases again. These soils experience a slight droughtiness limitation.

Subgrade 3b

The remaining agricultural land is mapped as Subgrade 3b. The low-lying land has heavy silty clay loam topsoils over heavier textured subsoils. These soils show evidence of extended waterlogging in the form of gleying from the surface. A soil pit in the southern block showed the subsoils were not slowly permeable but that the water table was high in the profile. The soils were assessed as being Wetness Class IV with the profile expected to be wet within 40 cm for 91-210 days.

To the west of the road there are steep slopes which are downgraded to Subgrade 3b. In addition the area west of the houses has higher stone contents than the Grade 2 land and is downgraded by droughtiness.

Other land

The residential areas, railway and roads are mapped as urban. The embankments and extensive gardens are marked as non-agricultural. An area of water has been mapped within the RSPB reserve where drainage has been discouraged.

Resource Planning Team
Taunton Statutory Unit
November 1994

APPENDIX 1

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1971) Drift Edition, Sheet 325, Exeter

MAFF (1972) Agricultural Land Classification Map, Sheet 176, Provisional 1:63,360 scale.

MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of agricultural land), Alnwick.

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5, Soils of South West England, 1:250,000 scale.

APPENDIX 2

DESCRIPTION OF THE GRADES AND SUBGRADES

Grade 1 - excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly include top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a - good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b - moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Descriptions of other land categories used on ALC maps

Urban

Built-up or ‘hard’ uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

‘Soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to ‘soft’ after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

Source: MAFF (1988) Agricultural Land Classification of England and Wales (Revised guidelines and criteria for grading the quality of agricultural land) Alnwick.

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for between 31 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period. ‘In most years’ is defined as more than 10 out of 20 years.

Source: Hodgson, J M (in preparation) Soil Survey Field Handbook (revised edition).