Appendix 3.3: Models – Ecological Habitat

Native Woodland Model

Organisation: Macaulay Institute

Date: Various stages of development from 1997 - 2004

Objectives

- To predict the potential occurrence and distribution of a range of native woodland communities.
- To optimise the relationship between the growth requirements for native woodlands with existing biophysical conditions

Methodology

The methodology relies on the interpretation of integrated soils and land cover data in relation to the growth requirements of different woodland types. Combinations of these attributes are assessed and an optimal native woodland type is assigned to each combination. Examples are given in the table below.

Geology and parent material	Soils	Terrain	Existing Vegetation	Predicted NVC Woodland type
Colluvium derived from acid rocks	Acid brown earths	Steep rocky valley sides	Acid grassland, bracken	Upland oak-birch woodland (W11)
Colluvium derived from acid rocks	Humus-iron and peaty podzols	Steep rocky slopes	Heather moorland dominant, some acid grassland	Upland acid birchwood (W17)/Scots Pine (W18) interchangeable category
Moraines derived from acid rocks	Peaty podzols and peat	Moundy moraine	Heather moorland and blanket bog	Scots Pine (W18)+ scattered scrub/woodland on peat
Drifts derived from acid rocks	Subalpine podzols	Upper hill slopes	*Calluna* (stunted)	Juniper scrub

Table 3.3.1: Examples of combinations of integrated soils and land cover data and predicted NVC Woodland type

Input requirements

- Major soil subgroup
- Geology
- Parent material
- Topography
- Land cover (current vegetation)

Results

The model was implemented for Eden (Figure 3.3.1), Tern (Figure 3.3.2) and Lossie (Figure 3.3.3) catchments.

Literature references

Towers, W., Hester, A.J., Malcolm, A., Stone, D. and Gray, H. 2002 The use of soils data in natural heritage planning and management. Soil Use and Management, 18, 26-33.

Hester, A.J., Towers, W. and Malcolm, A. 2003 Modelling the potential distribution of woodland at the landscape scale. In: The restoration of wooded landscapes (Eds. J. Humphrey, A. Newton, J. Latham, H. Gray, K. Kirby. E. Poulson and C. Quine). Forestry Commission, Edinburgh.

Towers, W., Hester, A.J., Malcolm, A., Hall, J. and Stone, D. 2004 The potential for native woodland in Scotland: the native woodland model. Scottish Natural Heritage, Battleby, Perth. Natural Heritage Management Series. 56p. Includes CD ROM. ISBN 1 85397 390 4

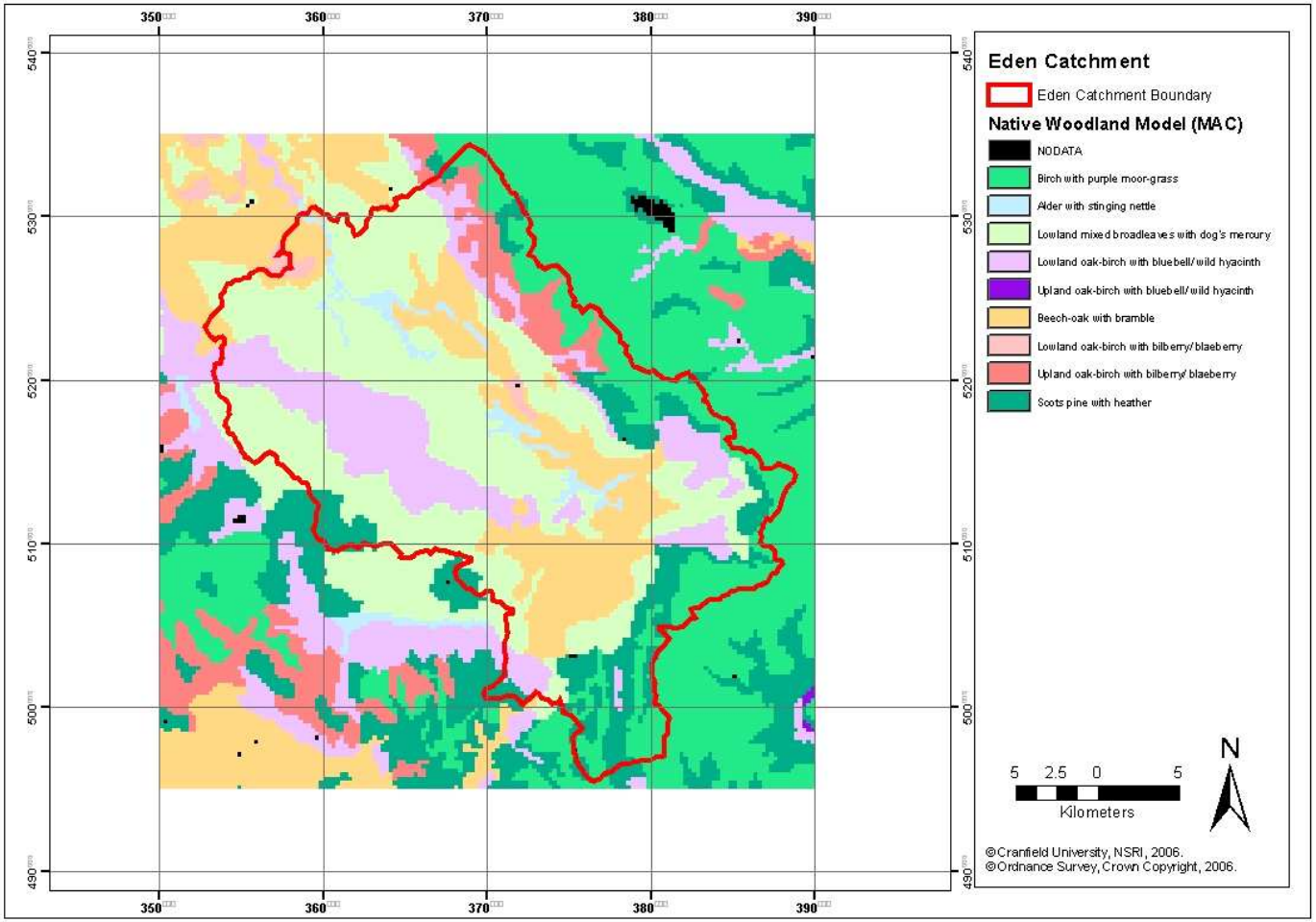

Figure 3.3.1: Native Woodland Model for the Eden catchment

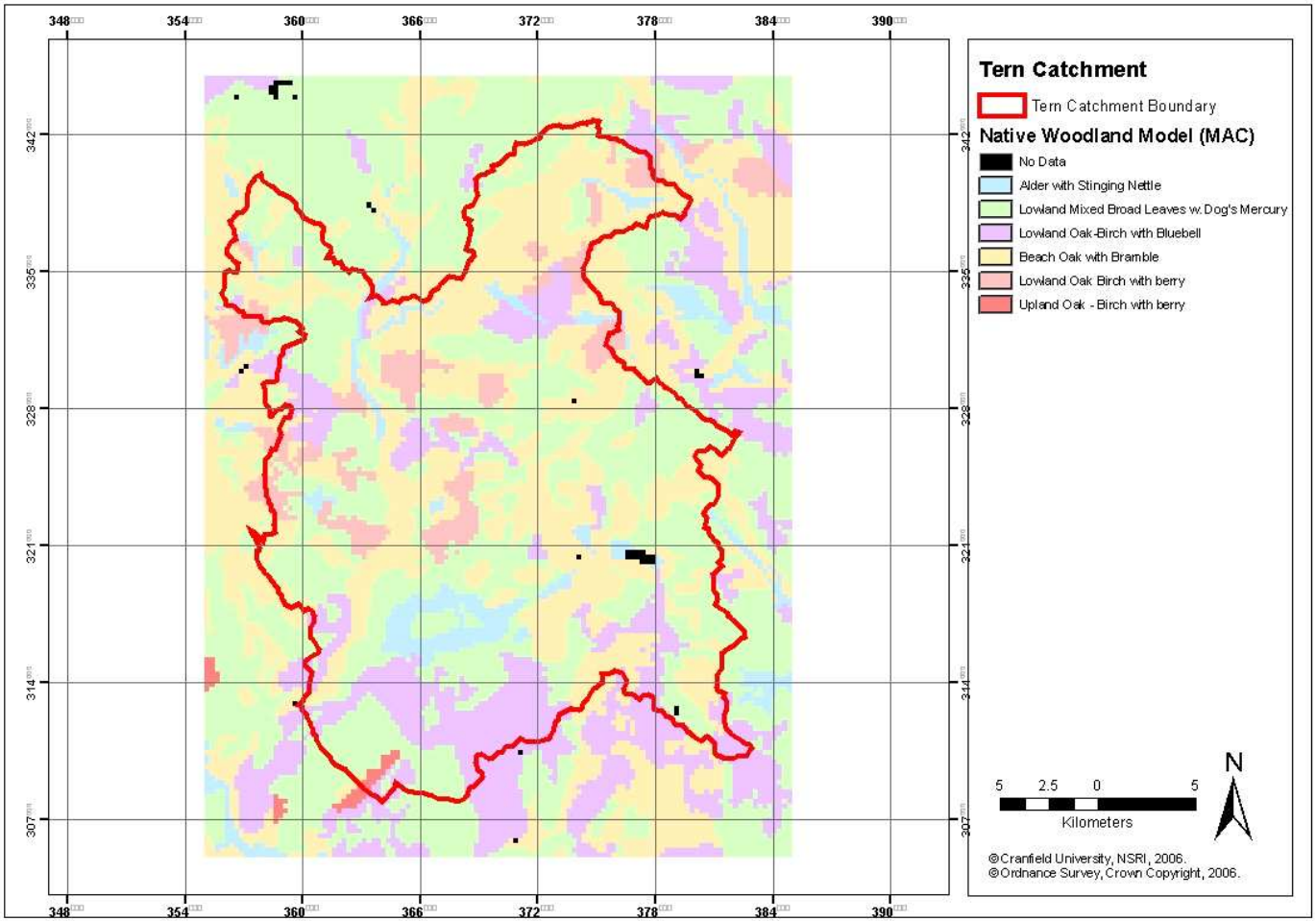

Figure 3.3.2: Native Woodland Model for the Tern catchment

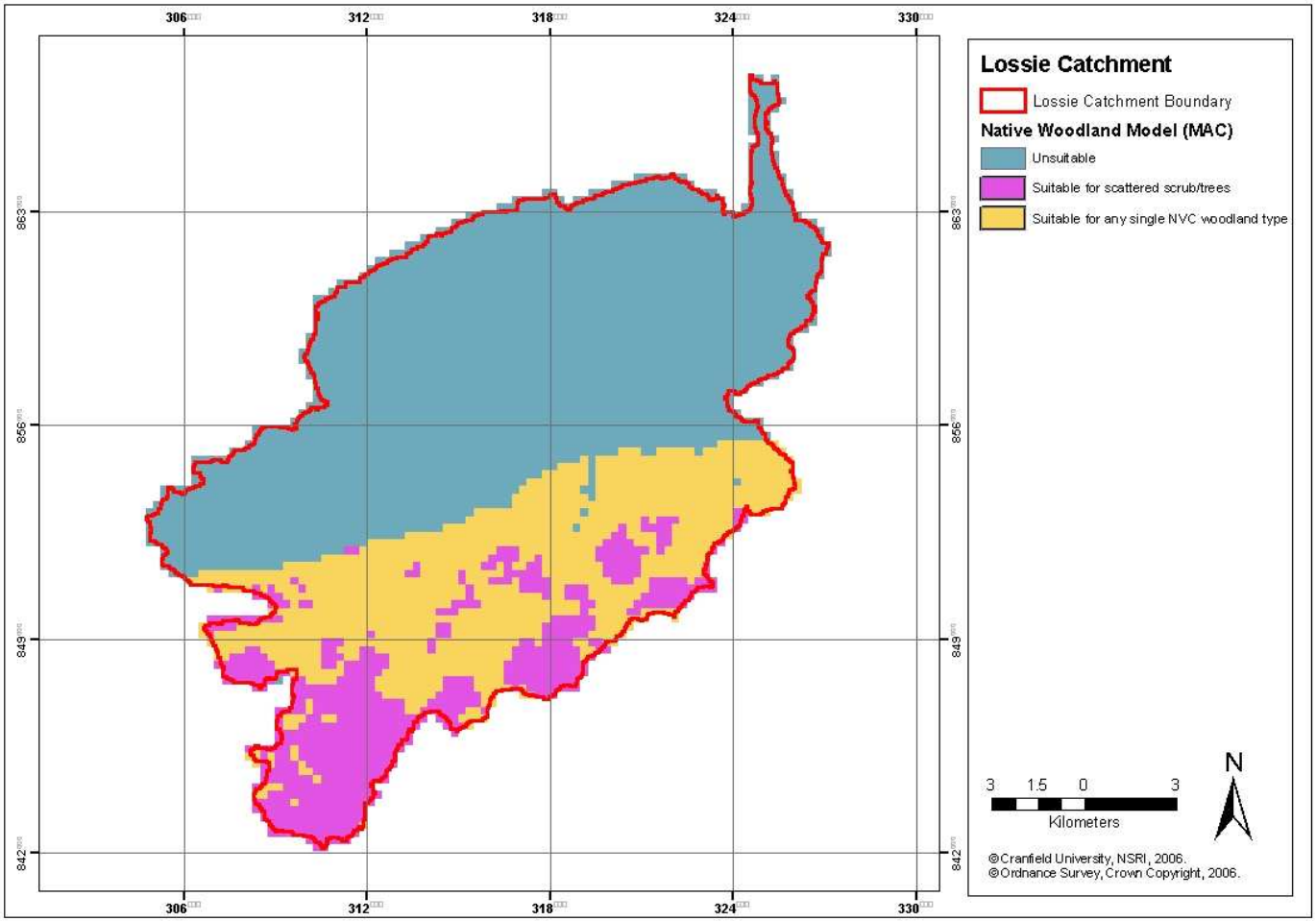

Figure 3.3.3: Native Woodland Model for the Lossie catchment

Lowland Heath Regeneration

Organisation: NSRI

Date: 1999

Objectives

The lowland heath model was set up for use by Planners in Cheshire and was designed to fit the lowland heath soils of that county (Newport, Crannymoor and similar acid sandy soils). There has been a marked reduction in the extent of lowland heath in Cheshire over recent years as more and more has been ploughed for agriculture. The Planners would now like to restore land to heath and required guidance on the areas with the greatest chances of success. These sandy acid soils (on Permo-Triassic sandstones) also occur in the Tern (very close to Cheshire) and in the Eden catchment and the model should be transferable to these areas. However, in its present form it is not relevant to the Lossie catchment.

Methodology

The classification is applied to the lead soil series of the soil associations. It is driven by properties used to define soil series; topsoil texture, topsoil pH, topsoil OC, and Wetness Class. In this way soil series are directly allocated to the classes (see legend table).

Class	Potential	Potential heath types
H1	High	Dry lowland heath
H2	High	Wet lowland heath
H3	High	Moor
H4	High	Lowland bogs
H5	High	Blanket peat
M	Moderate	Dry heath
L	Low	Dry heath
N	None	Dry lowland heath

Table 3.3.2: Suitability classification for Lowland Heath

Input requirements

- NATMAP Map unit – from which the lead series is identified

Results

The model was implemented for the Eden (Figure 3.3.4) and Tern (Figure 3.3.5) catchments. As the model relies entirely on NATMAP units, it was implemented for the Lossie catchment.

Literature references

Palmer, R.C. and Bradley, R.I. (1999). Supply of soil, natural grassland type and heathland regeneration potential maps. Unpublished report, Data to Cheshire County Council. JF 7001V.

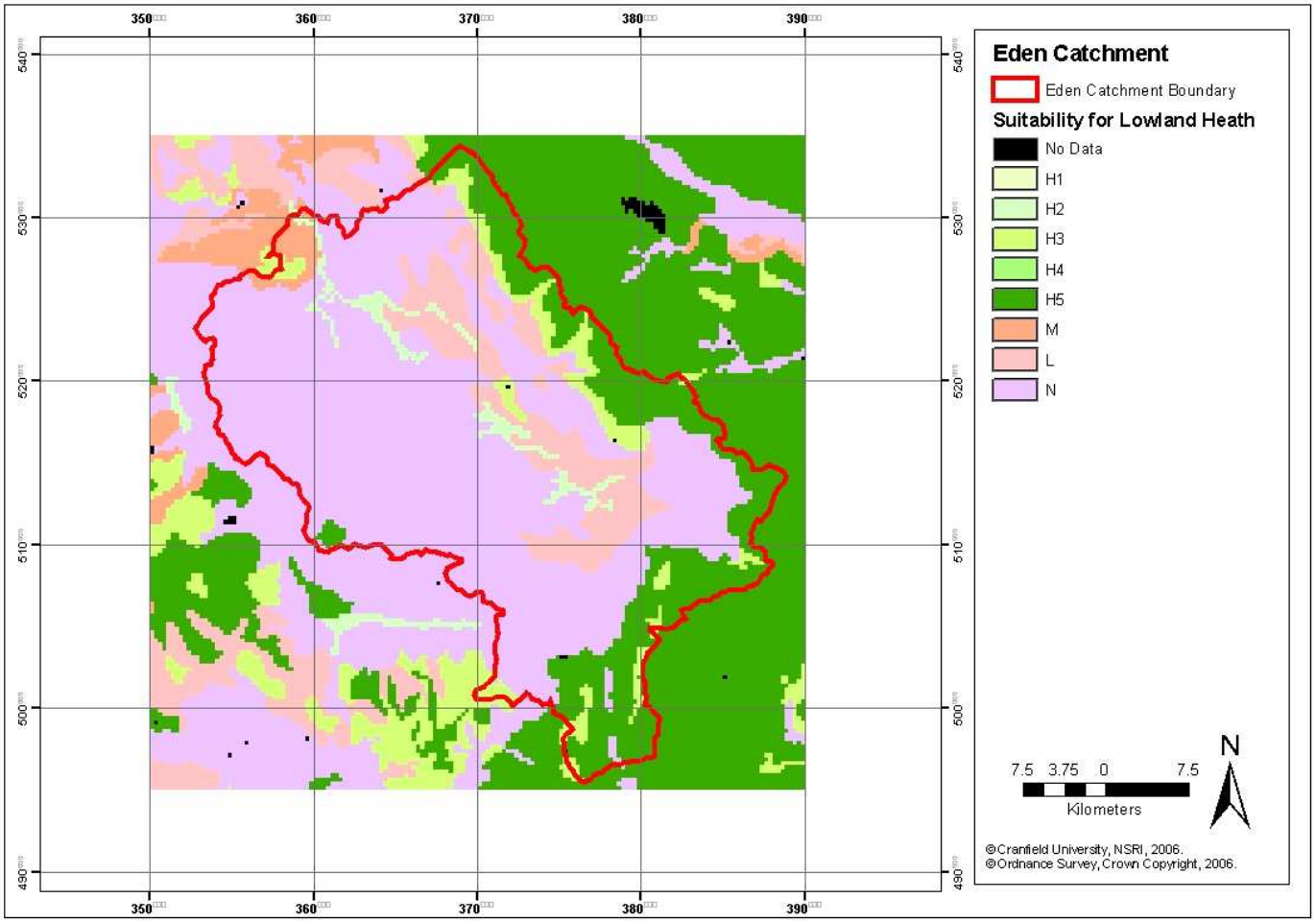

Figure 3.3.4: Suitability for Lowland Heath for the Eden catchment

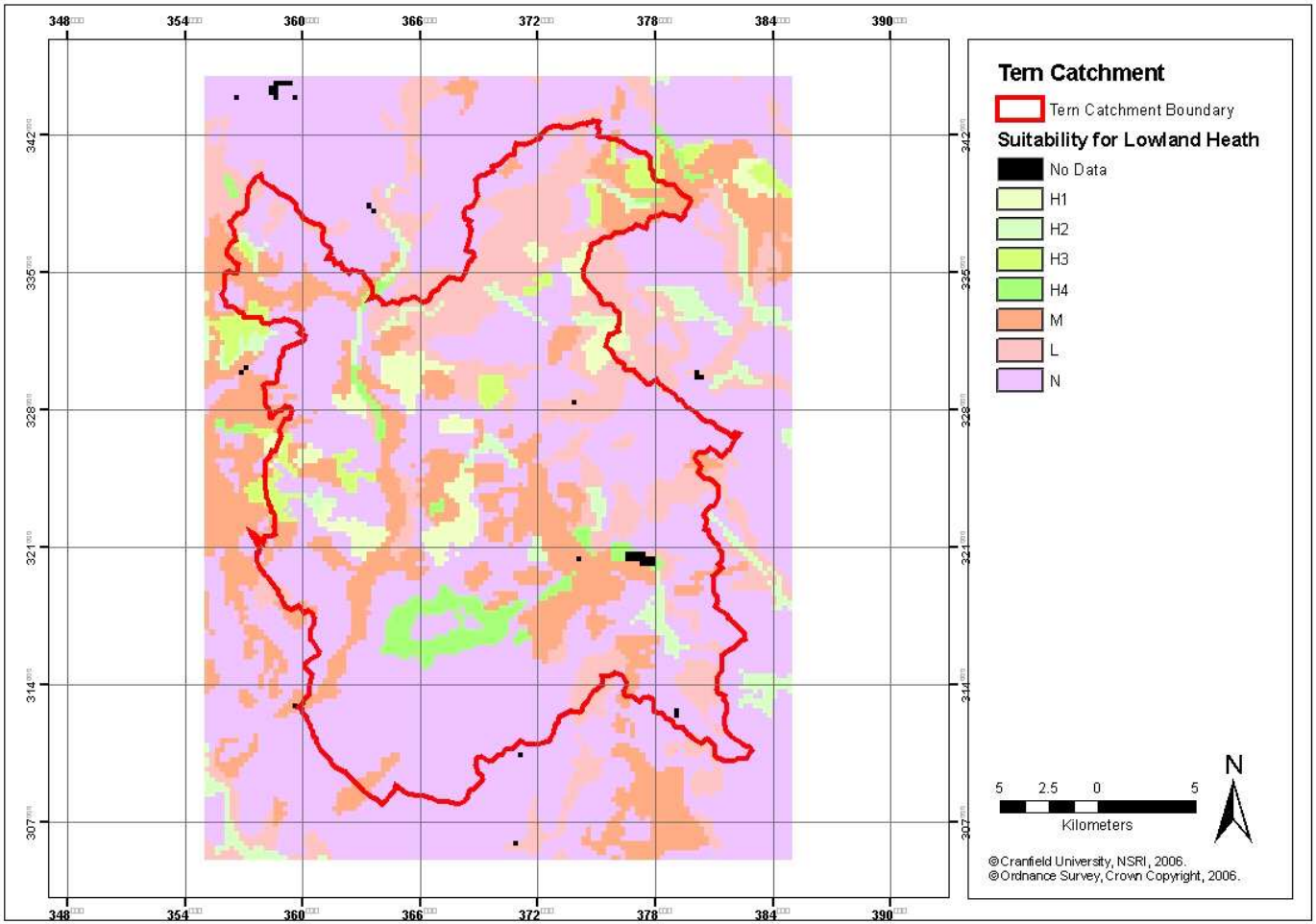

Figure 3.3.5: Suitability for Lowland Heath for the Tern catchment