

## Appendix 3.4: Models – Providing a Platform

### Shallow foundations/Natural Shrinkage

Organisation: NSRI

Date: 1979

#### Objectives

- To assess the suitability/limitations of soils for shallow (or 'low') building foundations

#### Methodology

Factors to consider include:

- Potential shrink-swell (this is a commercial product developed by NSRI)
- Bearing capacity
- Amount of settlement
- Soil wetness and permeability
- Susceptibility to flooding
- Frost (although less important)
- Slope stability
- Type and width of foundations

Soils classified into 3 types of limitations: slight, moderate and severe.

#### Input requirements

- Series

#### Results

The model was applied to both the Eden (Figure 3.4.1) and Tern (Figure 3.4.2) catchments. As Macaulay has a more sophisticated model (see below) the model was not implemented for the Lossie catchment.

#### Literature references

Jarvis, M. G., Hazelden, J. & Mackney, D. (1979), Soils of Berkshire, Soil Survey of England and Wales, Harpenden

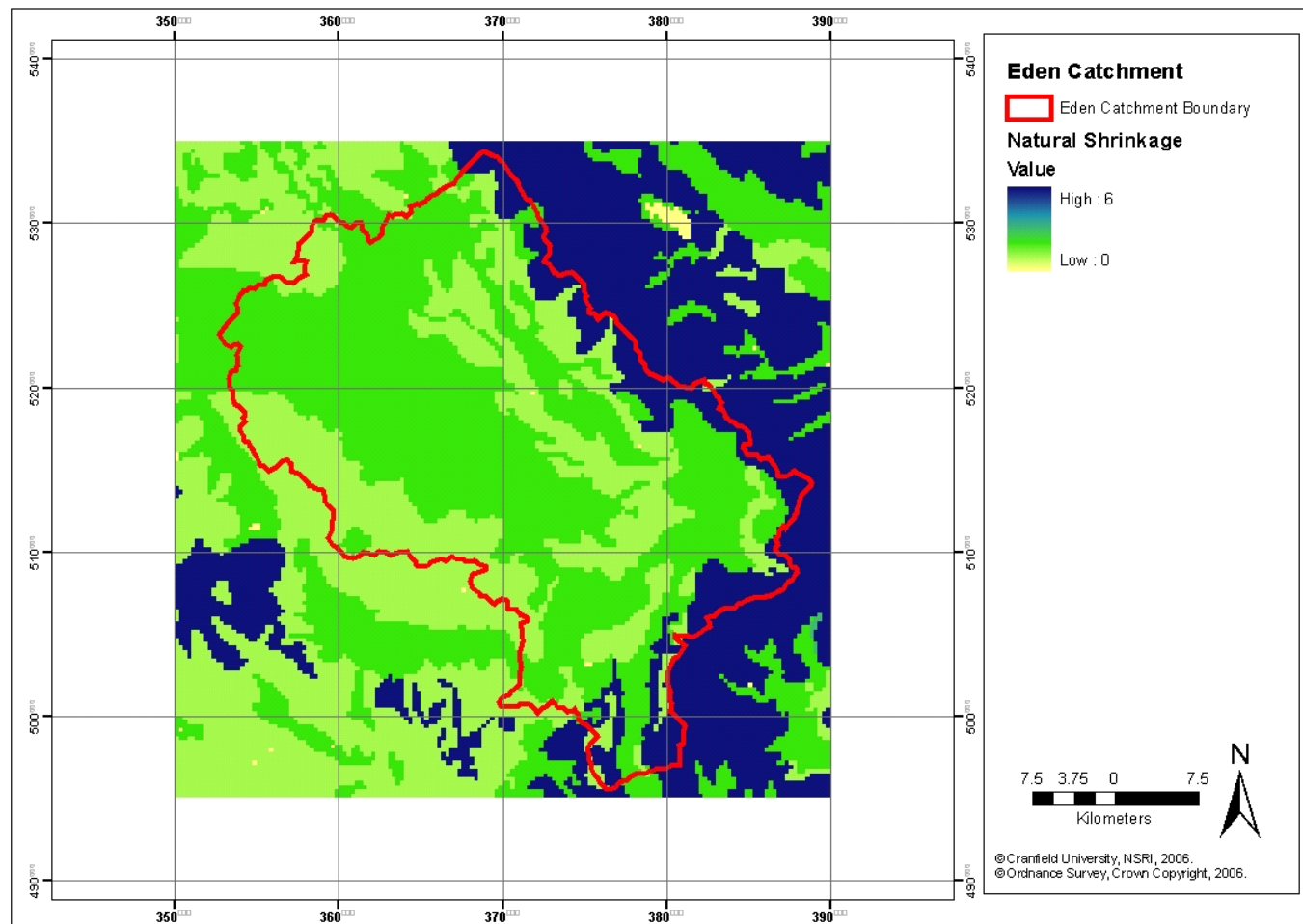


Figure 3.4.1: Natural Shrinkage for the Eden catchment

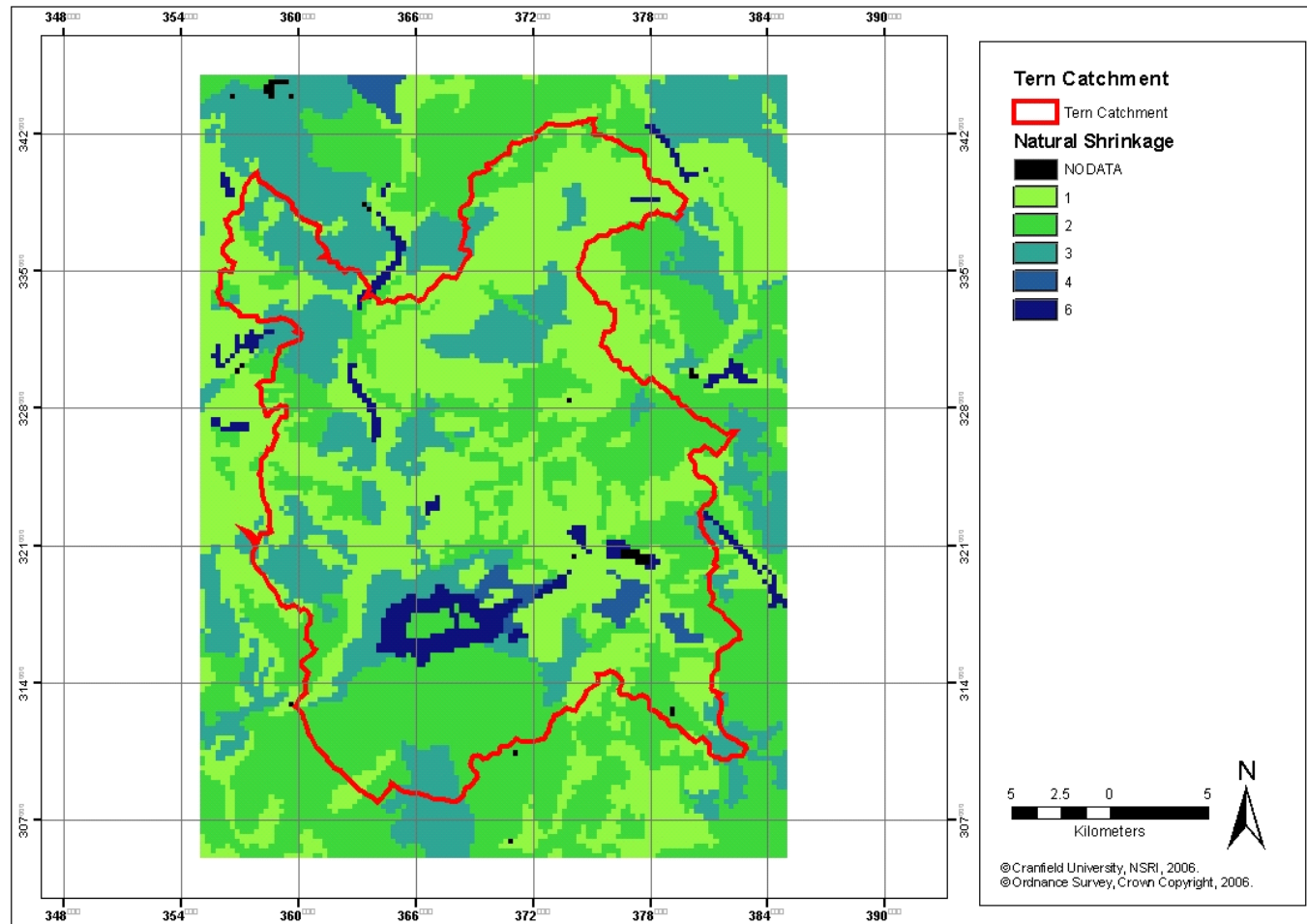


Figure 3.4.2: Natural Shrinkage for the Tern catchment

## Land Suitability for Housing

Organisation: Macaulay Institute

Date: 2002

### Objectives

The assessment considers the biophysical limitations to the development of land for housing in rural areas. Three classes of land are identified:

**HD Class 1.** Land where biophysical limitations are not limiting.

**HD Class 2.** Land where biophysical limitations are limiting.

**HD Class 3** Represents areas of land with an intimate mixture of HD Classes 1 and 2; It does not represent land which is intermediate in quality between HD classes 1 and 2

### Methodology

See figure 3.4.3

### Input requirements

- Rock outcropping
- Uncololidated sands
- Texture
- Frost heave
- Affected by permanent groundwater
- Flood risk
- Soil variability
- Slope
- Shrink-swell

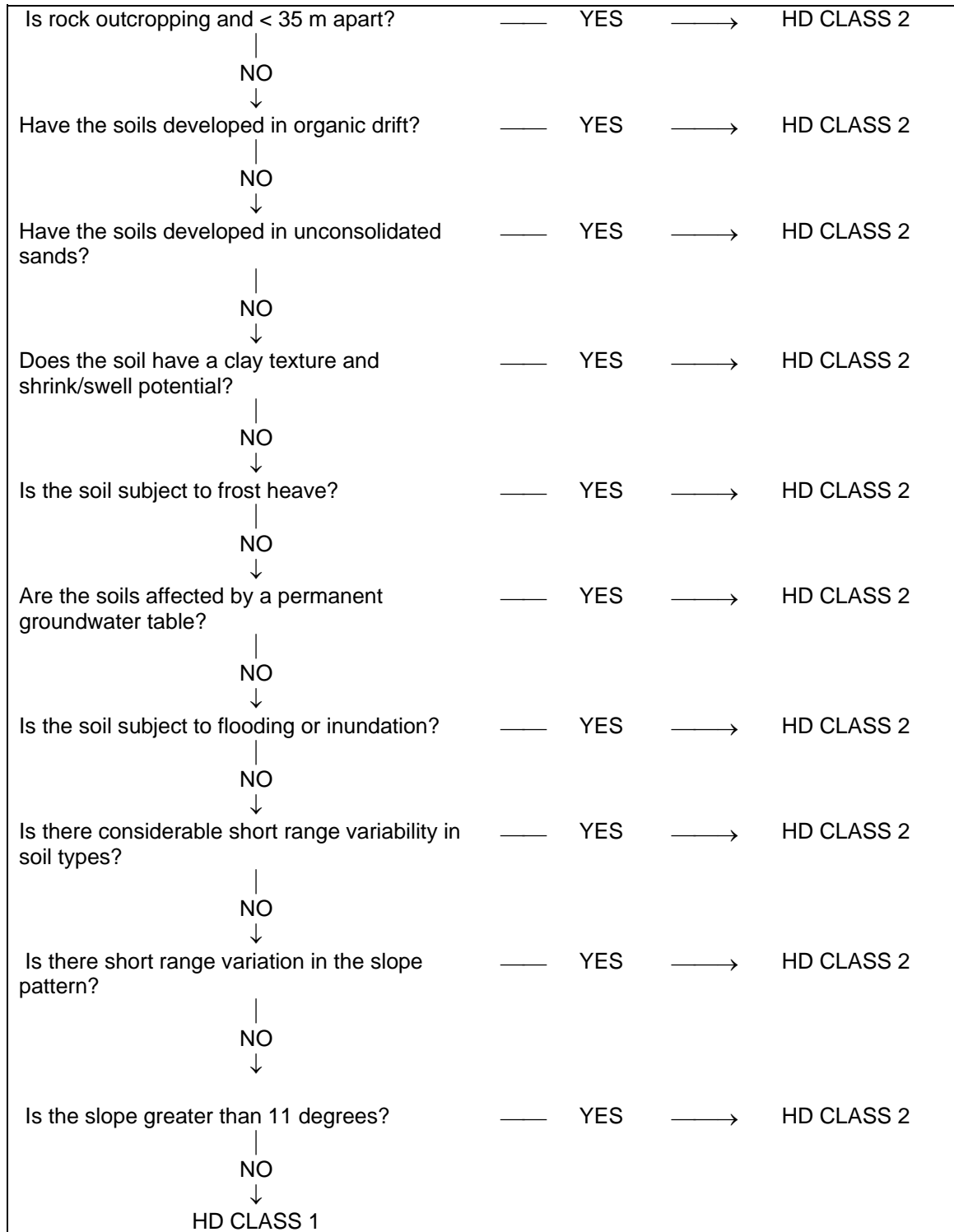
Datasets required are Soils, HOST and DEM. A number of the rules rely on the interpretation of soil maps, and are not related to specific individual attributes.

### Results

The model was implemented for the Eden (Figure 3.4.4), Tern (Figure 3.4.5) and Lossie (Figure 3.4.6) catchments.

### Literature references

Towers, W., Lilly, A., McKeen, M. and Malcolm, A. 2002 Mapping potential land supply for housing in Scotland. A report for Communities Scotland, Macaulay Research Consultancy Services, November 2002.



**Figure 3.4.3:** Flow chart showing the implementation of the decision rules

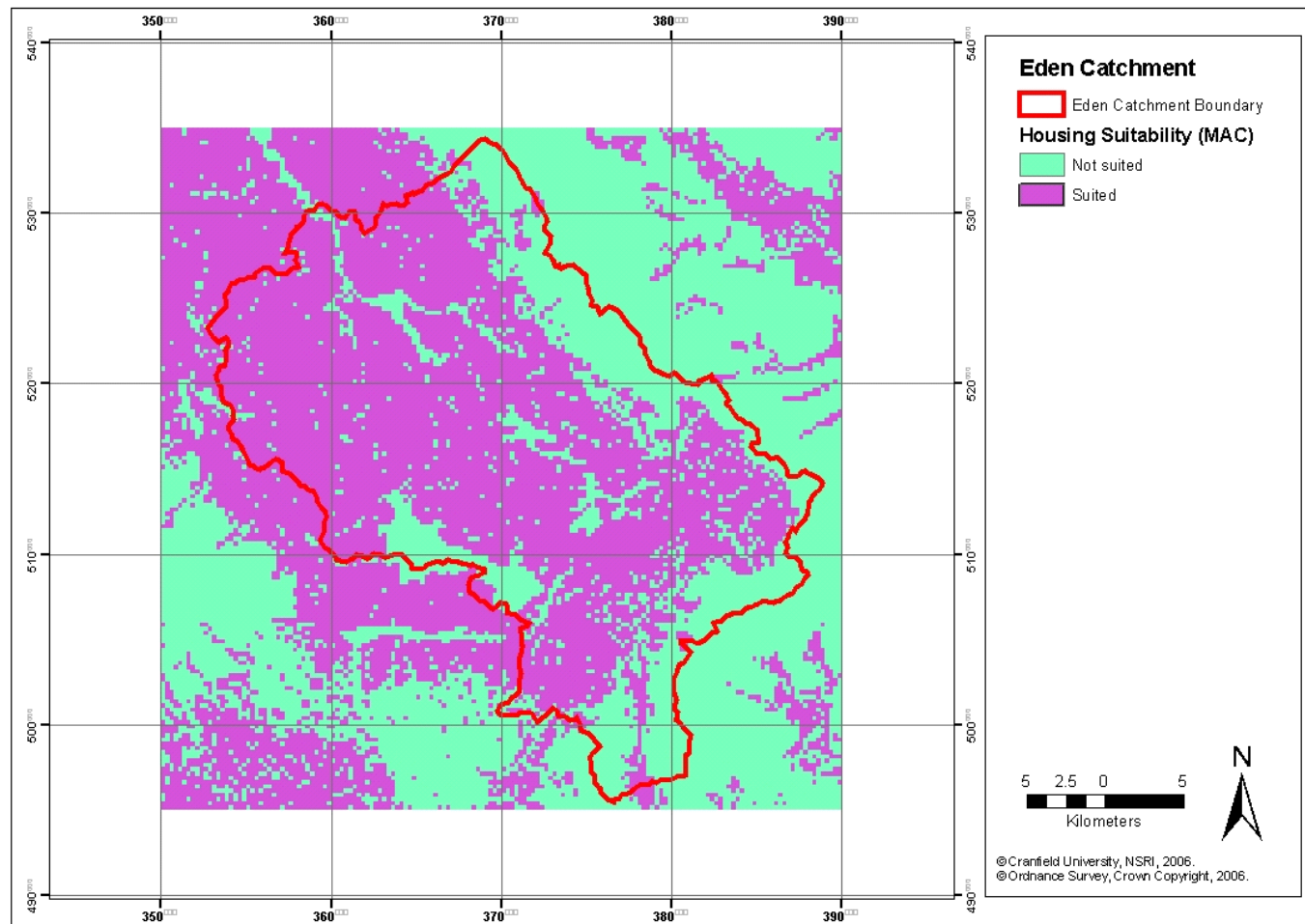


Figure 3.4.4: Housing Suitability for the Edén catchment

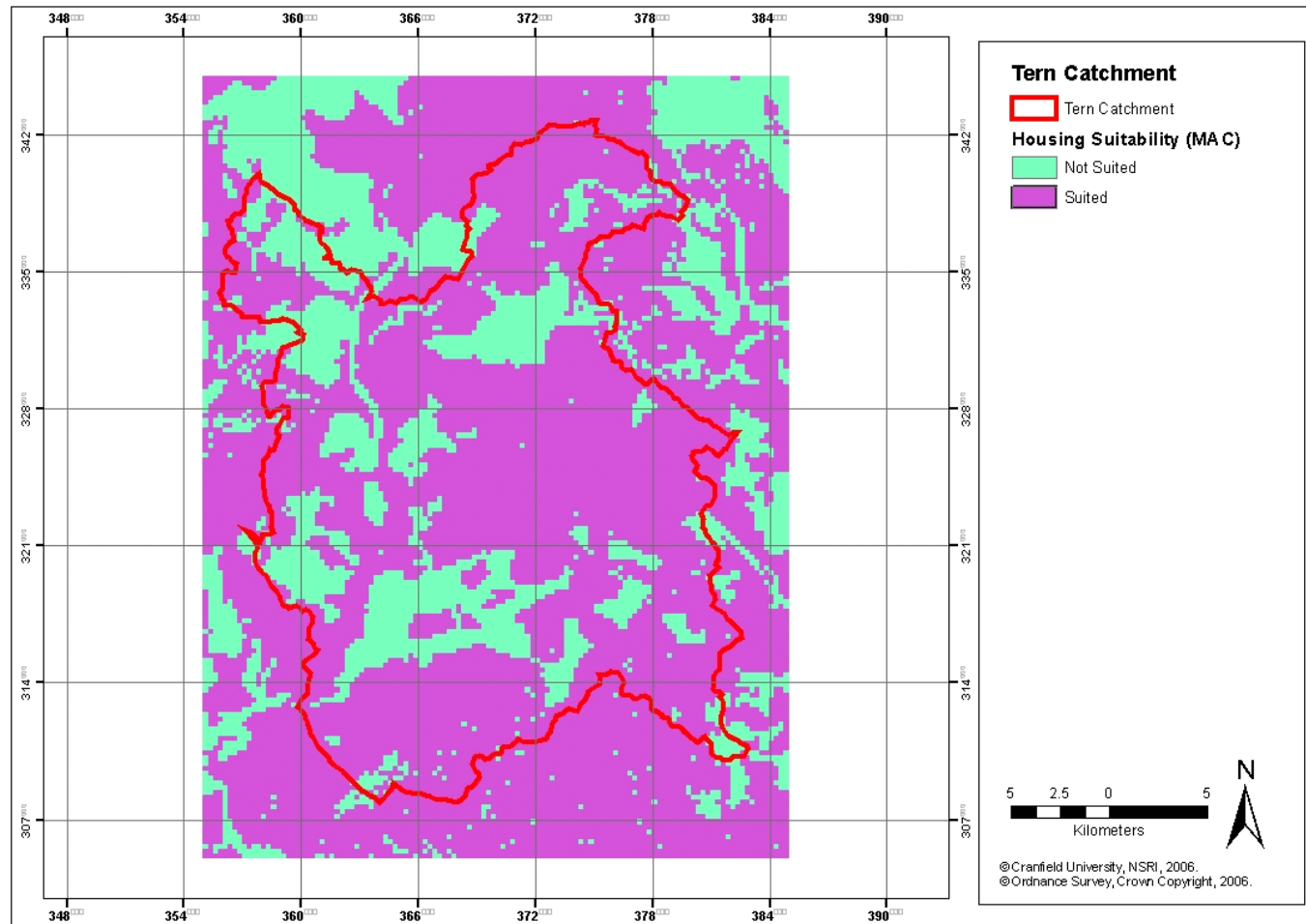


Figure 3.4.5: Housing Suitability for the Tern catchment

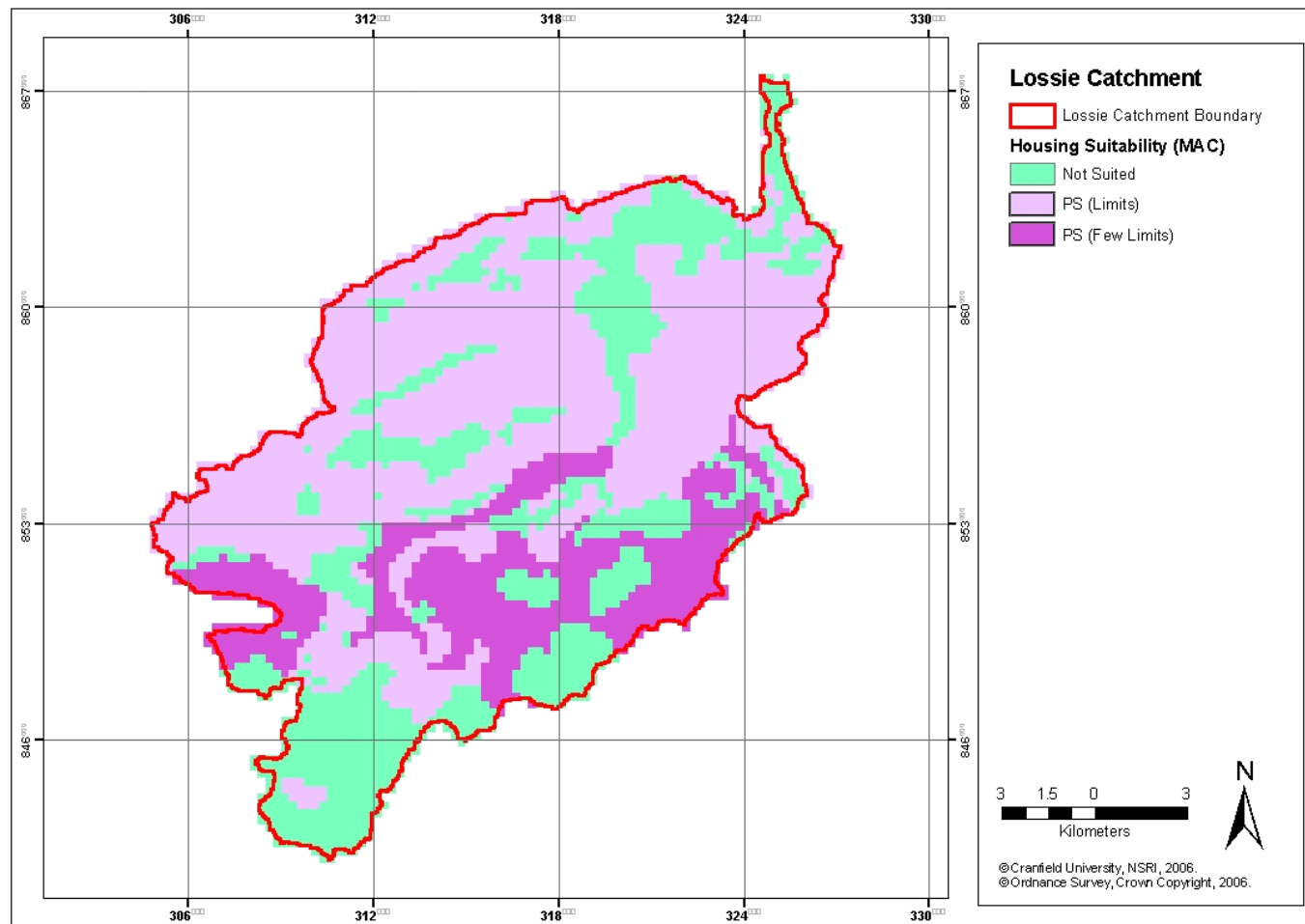


Figure 3.4.5: Housing Suitability for the Lossie catchment