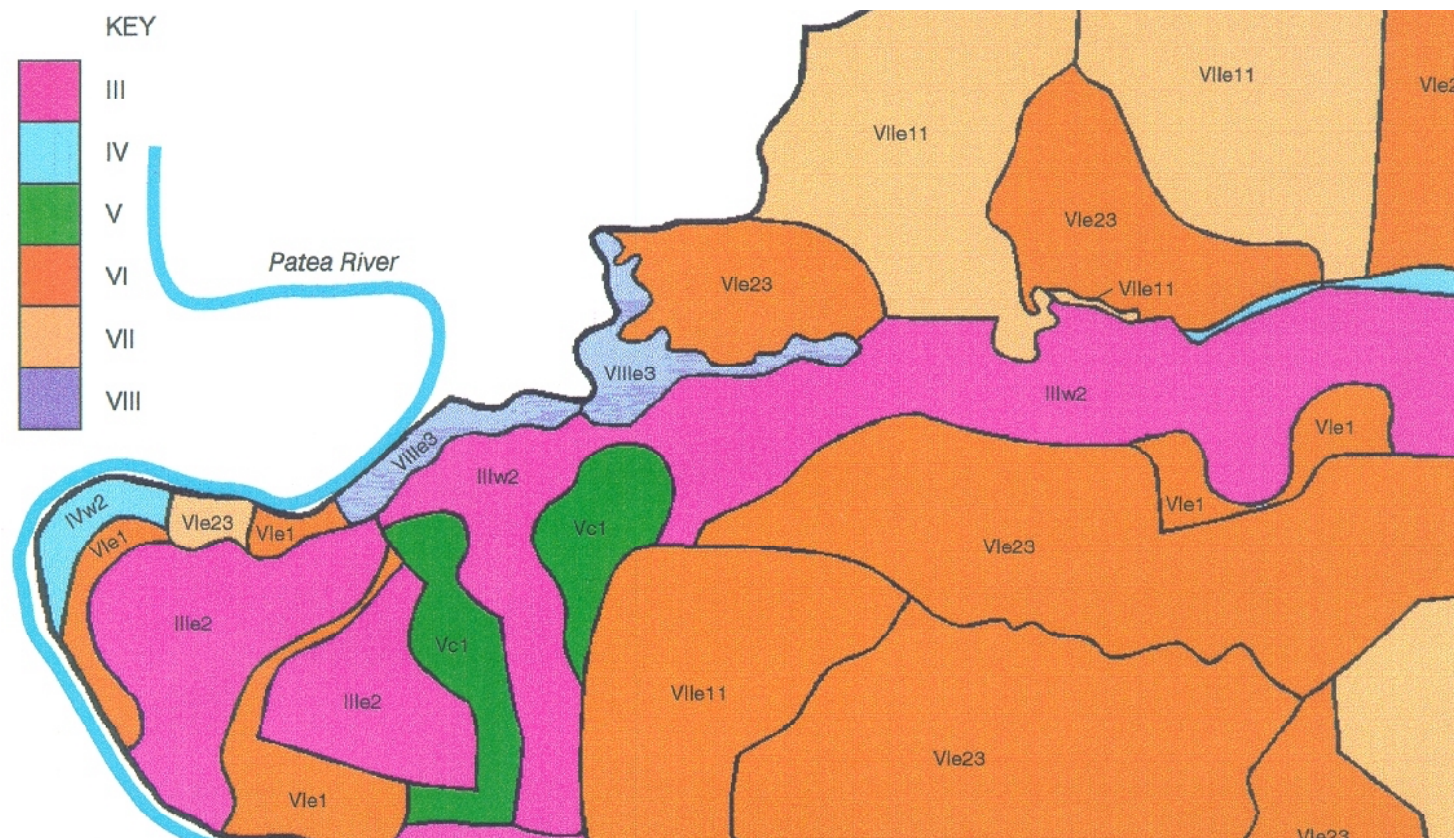




Aerial photograph showing farm subdivision



Land use Capability classification of the area shown in the above photograph

Introduction

Land Resource Inventory mapping plays a vital role in resource management in New Zealand. It assists in the planning for future land use, particularly agriculture, because it assesses the land resource and its potential for sustainable agricultural production.

It had its beginnings in the 1940's and 1950's when a system of land classification was developed by the Soil Conservation and Rivers Control Council. Today, this classification system is used by the Taranaki Regional Council Land Management Department at a farm scale to assess a variety of land management issues.

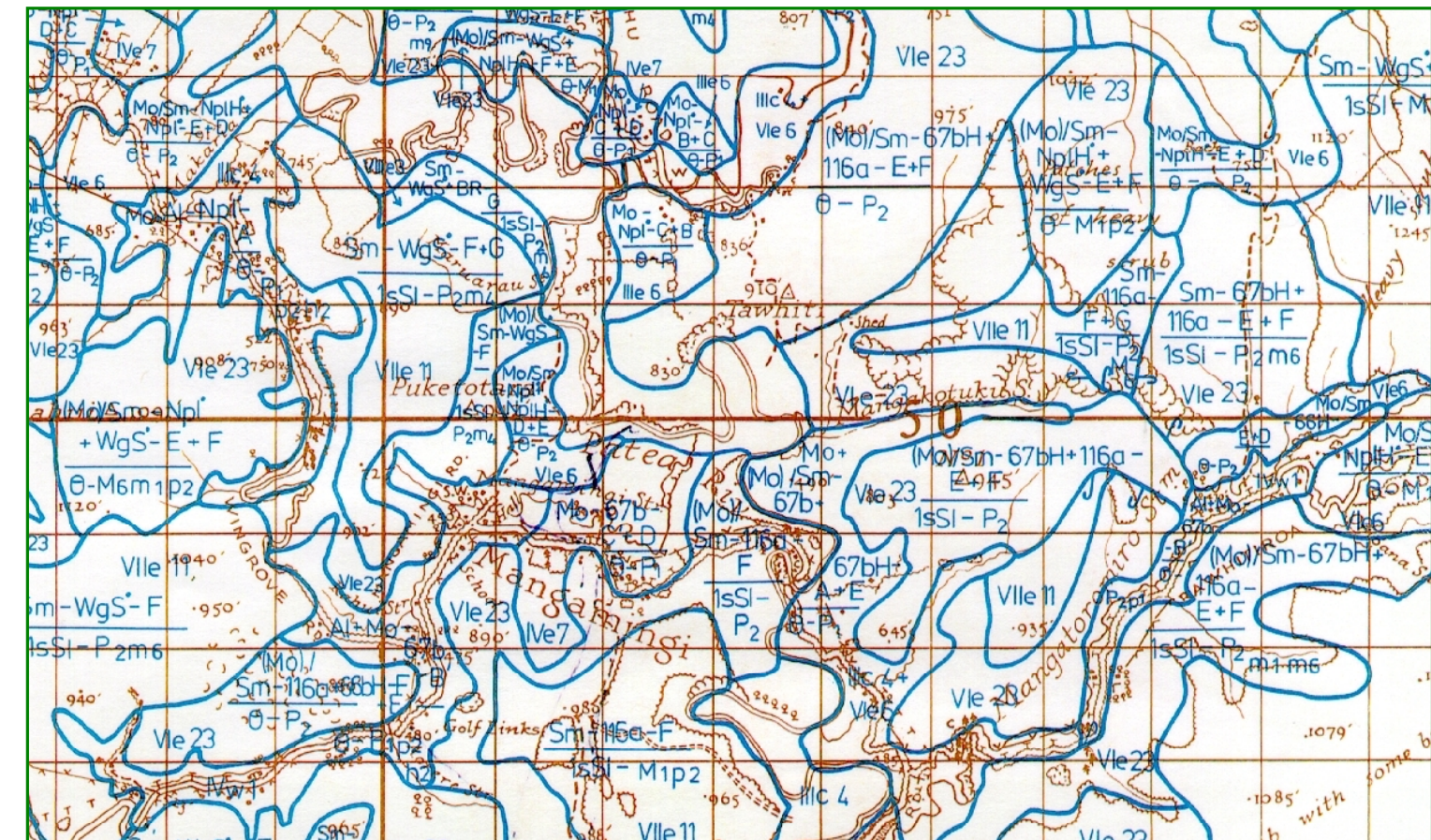
A national coverage of Land Resource Inventory worksheets and supporting documents were prepared after intensive field work, aerial photograph interpretation and the use of data from other agencies. The data is displayed on the worksheets at a 1:63,630 (one inch to the mile) scale, which allows relatively detailed planning at regional levels, yet enables national coverage.

The Land Resource Inventory worksheets (see below) provide two sets of data:

i) Land Resource Inventory (LRI) - inventory of five physical factors (rock, soil, slope, erosion type & severity, and vegetation) which is the basis of assessing land resources.

ii) Land Use Capability classification (LUC) - evaluation of the potential for sustained agriculture production (land use) in the long term.

The Taranaki-Manawatu Region worksheets were published in 1979 and are part of ten regions in the North Island. These worksheets and accompanying information now provide the basis of this Council's land resource inventory field mapping with particular emphasis on farm planning with respect to sustained agriculture in the future.



Land Resource Inventory Worksheet (scale 1:63,360(1 inch:1 mile))

Land Resource Inventory Data

The Land Resource Inventory components are recorded in the form of a code for each mapped unit:

- Rock Type - Soil Unit - Slope Group
- Erosion Severity & Type - Vegetation Cover

The code is enclosed by a boundary, which indicates that the information mapped is homogeneous throughout that area (within the limitations imposed by the scale of mapping). A new inventory area is mapped where any one factor changes. Each code is explained in an attached legend. These factors determine the Land Use Capability (LUC) of each map unit.

Climate

Climate is an integral physical factor in the assessment of Land Use Capability. Climatic data determines the suitability of the land for pastoral, cropping, horticulture, and forestry use. It determines how soil-building processes take place and therefore determines the productivity of the site. This factor is not recorded directly in the survey process. Climate also affects the erosion processes and likely soil conservation measure suitable for a Land Use Capability unit.

Rock Type

The most frequent rock types in Taranaki are sedimentary sandstone, mudstone and indurated greywacke. In most cases these rocks are overlain by volcanic tephra, alluvium, loess, and wind blown sand. The rock type directly influences the soil type, surface stability and land use of any site.

Soil

Soil information is based on the New Zealand Soil Bureau soil survey. Typical soils listed for the Taranaki-Manawatu Region are listed in the Land Use Capability Extended Legend. Soil description and interpretation can be gained from a number of sources (appropriate soil maps and associated reports) which provide details about the properties of a soil, its potential uses and productive potential.

Slope

Slope angles are measured, or estimated visually in the field and/or from aerial photographs. The dominant slope is recorded for each map unit as one of seven groups, each of which have different management characteristics.

Erosion

Erosion severity and type is assessed essentially by field work as well as aerial photograph interpretation, aided by the knowledge of rock, soil and climate factors which directly affect the erosion land use pattern. Erosion types in Taranaki include: soil slip; sheet; debris avalanche; wind; streambank; scree; earthflow; gully; slump; earth slip; deposition; rill; and no erosion. The severity of the erosion is recorded as either a

percentage of bare ground (generally sheet, wind, scree erosion) or according to a scale (insignificant to extreme).

Vegetation

Vegetative cover is essentially derived from fieldwork as well as aerial photograph analysis, supplemented by published maps and descriptions for forest areas. Vegetative cover for each map unit is recorded as one of five major groups: grassland, cropland, scrubland, forest, and miscellaneous weeds, herbs etc.

Land Use Capability Classification

Land Use Capability classification is described as a “systematic arrangement of different kinds of land according to those properties that determine its capacity for permanent sustained production”. The word capacity is used in the sense of “suitability for productive use” after taking into account physical limitations, management requirements, and soil conservation needs the land may have. The Land Use Capability classification is based on an interpretation of the physical information in the Land Resource Inventory, supplemented with information on climate and the effects of past land use which are only undertaken by trained professionals.

There are three components associated with the Land Use Capability classification - a class, subclass and unit.

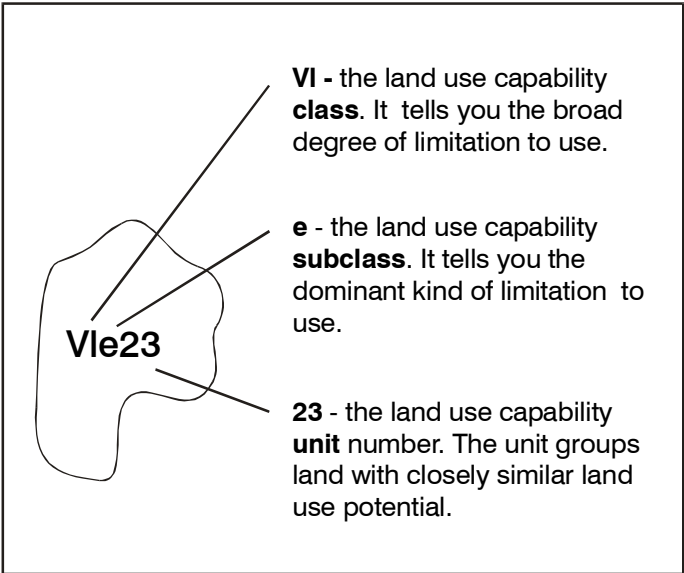


Figure 1: Example of a mapped area of Class Vle23

Land Use Capability Class

There are eight Land Use Capability classes. Simply, land classes I to IV are suitable for pastoral, arable, and forestry use while Classes V to VII land is suitable for pastoral or forestry use. Class VIII land is suitable for protection purposes only.

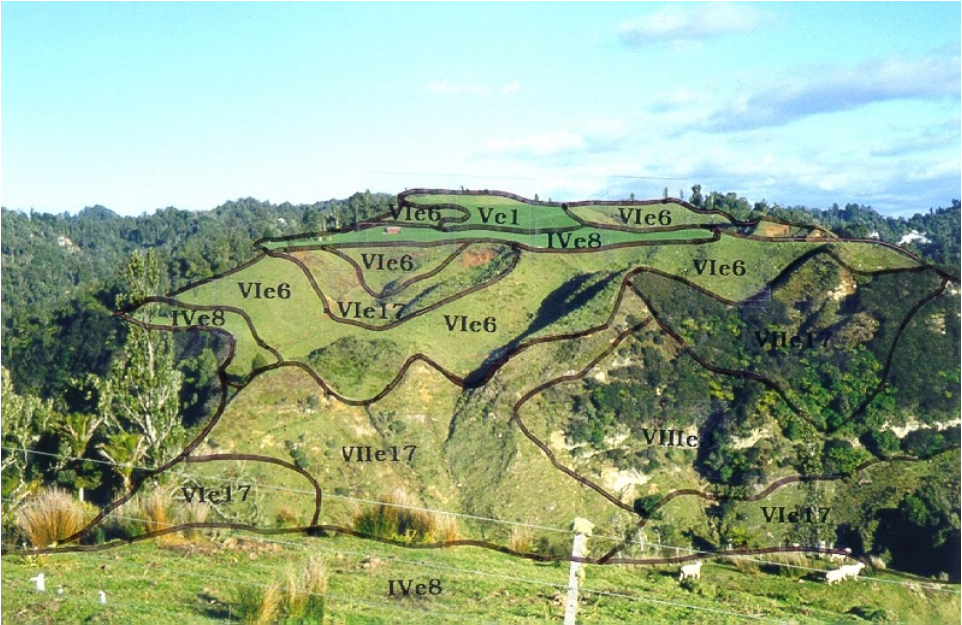
Each land class can be defined further according to limitations to use and suitable management techniques.

Land Use Capability subclass

The capability subclass provides for a grouping of units with the same kind of limitation or hazard. The four general limitations recognised are erodibility (e), climate (c), wetness (w), and soil(s).

Land Use Capability unit

At the most detailed level, the third category, the Land Use Capability unit, groups those inventory units which responds similarly to the same management, have about the same potential yield, and require similar conservation measures.



Photographic interpretation of mapping land use capability units

Farm Mapping

Sustainable land use options for a property are assessed by a land resource study in a combination of extensive fieldwork, stereoscopic analysis of aerial photographs, and the use of the latest publicised information available relating to soil and geology in the area. The fieldwork involves mapping the Land Resource Inventory data at a suitable farm scale (eg, 1:10,000). All data is checked and modifications made where necessary to conform with the Land Resource Inventory worksheets (1:63,360) based data.

From the field work, each map unit is given a Land Use Capability class which in combination to the Land Resource Inventory information allows a qualified land resource scientist to determine its suitability for productive land use with respect to the physical limitations, management requirements, and soil conservation requirements. Farm plans can then be prepared detailing the potential and recommended land use (see maps, p4).

Land Resource Mapping

The system of mapping natural and physical resources already described, is undertaken in Taranaki by trained,

professional officers employed by the Taranaki Regional Council to provide a service to land holders.

For both land holders and advisors, it is only possible to consider sustainable land use and management options when there is a complete understanding of the land’s capability to sustain a particular level of productive use.

For further advice or information contact:
The Land Management Section at
Taranaki Regional Council,
Private Bag 713
Stratford
Ph: 06 765 7127 Fax: 06 765 5097