

LAND USE CAPABILITY

Introduction

Land Use Capability (LUC, or Rural Land Use Capability, RLUC, to distinguish it from Urban LUC) is an assessment of the land according to its suitability for permanent, sustained production. This is based on its physical properties determined in the LRI. The assessment carries a use-risk factor as it is an assessment based on current technology and conditions at the time of assessment and outcomes of land use may depend on other influences, such as technology change. It does not indicate a preferred land use for a given area; rather it shows the currently assessed capability of the land within its determined physical limitations.

LUC Classes

The major grouping of the LUC assessment is the LUC class (Figure 1). There are 8 classes ranked in order of decreasing capability for use from I to VIII (Table 6). The capability class of an area of land indicates its total degree of limitation and the higher the class the less versatile the land. Class I to IV lands are generally arable while class V to VIII land is unsuitable for cropping. Class I land is the best agricultural and horticultural land in New Zealand and is able to be used for a wide variety of crops with insignificant physical limitations to arable use. In contrast, Class VIII land has maximum limitations to land use with no capacity for permanent, sustainable production.

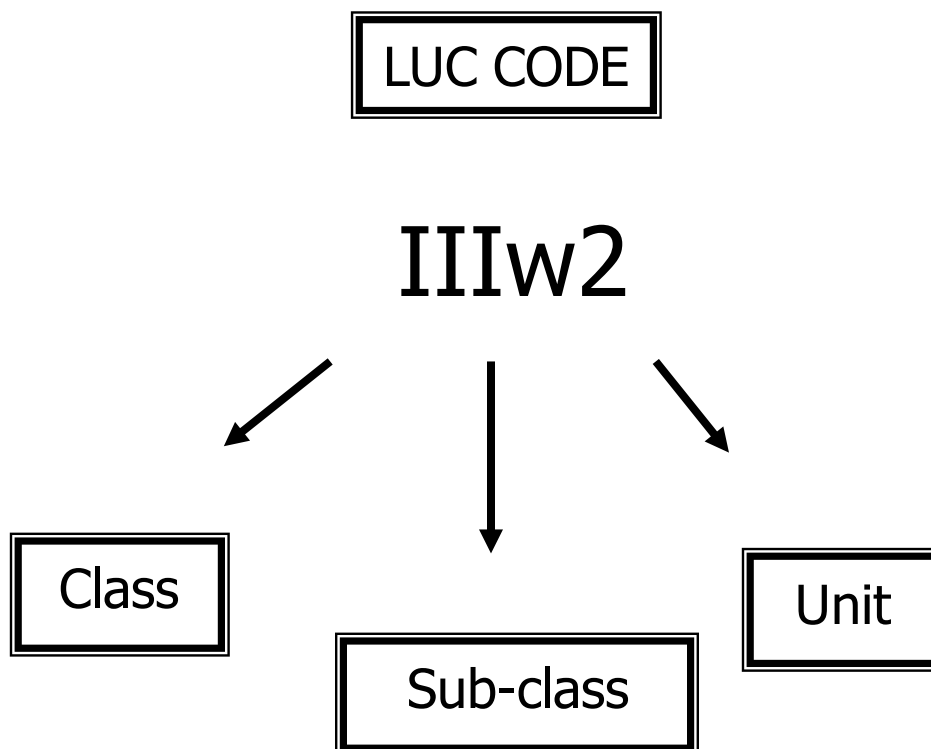


Figure 1: The LUC code and its components

Table 6: Description of LUC Classes

CLASS	LIMITATIONS	LANDSCAPE AND CLIMATE	LOCATION
I	Versatile, multiple use land with minimal physical limitations to arable land use. No plant nutrient deficiencies and respond to fertiliser applications. Minimal erosion risk.	Flat to nearly flat with deep, easily worked soils. Climate favourable to growth of a variety of plants	Confined to small areas of well drained soils derived from alluvium and are mostly located on flood plains of major rivers. Occurs throughout New Zealand but the total area is small.
II	Very good land with slight limitations to arable use that can be overcome by management and conservation practises. Limitations are wetness, slight textural problems or shallow soils.	Flat to undulating land that can be used for cultivated crops, forestry or pastures.	More abundant than class I land and occur in similar locations with the addition of some areas of fine textured volcanic loam in the North Island.
III	Moderate limitations restrict the range of crops and/or make special conservation measures necessary. Moderate erosion risk when cultivated, shallow or stony soils of plains and terraces and soils of narrow river valleys where runoff causes wetness.	Undulating to rolling country that can be used for some cultivated crops, pastures and forestry.	Widely distributed throughout New Zealand on undulating to rolling country.
IV	Severe limitations to arable use, such as erosion, shallow, stony and/or low fertility soils, excessive wetness and climate effects of altitude requiring careful management and/or intensive conservation.	Undulating to strongly rolling country, but with more pronounced limitations than Class III land. Colder, higher altitudes.	Occurring in similar situations to Class III land but with more severe limitations to cropping.
V	High producing pastoral land unsuitable for cropping but with few limitations to pastoral or forestry use. Limitations to arable use are slope, presence of boulders or rock outcrops and excessive wetness. Erosion is not a dominant limitation in this class with	Strongly rolling to moderately steep hill country or bouldery river flats. Often has a climate limitation.	Limited extent and confined to stable hill country or localised areas of river flats.

	the land surface stable under a permanent vegetation cover.		
VI	Non-arable land with moderate limitations and hazards under perennial plant cover. Erosion is the dominant limitation but can be minimised by using appropriate conservation measures. Soil limitations occur but wetness and climatic factors are less dominant.	Relatively stable hill country and some shallow soils on fans and terraces.	Widely distributed and includes most of New Zealand's good, relatively stable hill country.
VII	Unsuitable for cultivation with severe limitations or hazards under perennial vegetation. Similar limitations to Class VI but more intense. Risk of erosion is usually the dominant limitation, requiring careful conservation for grazing use. Can also have severe soil, wetness and climate limitations. Can only support extensive grazing or erosion control forestry.	Eroding hill and steeplands, high altitude lands and shallow, stony and/or low fertility soils of the fans and terraces.	Most of the eroding hill and steepland soils of the North Island and the South island "high country" and West Coast Pakahi soils
VIII	Very severe to extreme limitations and hazards; unsuitable for arable, pastoral or production forestry use. Soil conservation and water quality are the main issues in land use. Main limitation is extreme actual or potential erosion. Used for catchment protection, recreation and water management.	High mountainous country but may include very steep slopes or highly erodable areas such as foredunes at lower altitudes.	Land of the axial ranges and other mountainous areas of both North and South Islands, coastal dunes and areas of very steep slopes in hill and steepland areas.

Examples of classes I to VIII are shown in Figure 2.

LUC Subclasses

The second factor in the LUC code is the subclass, which indicates the dominant kind of limitation (Table 7). Note that only one subclass can be expressed and the dominant is selected; there may be other subordinate limitations also present. Each LUC unit must have a subclass and some units to which the erodability, wetness or soil limitations do not apply are classed as having a climate limitation by default. There is an inverse relationship between limitations and versatility (Table 8).

Table 7: LUC Subclass definitions

Subclass	Description	Definition
e	erodability	where the susceptibility to erosion is the dominant limitation to land use
w	wetness	where a high water table, slow internal drainage and/or flooding constitutes the major limitation to use
s	soil limitation	where the major limitation to land use is a limitation in the rooting zone. This can be due to a shallow profile, stoniness, rock outcrops, low soil water holding capacity, low fertility (where this is difficult to correct) and salinity or toxicity
c	climate	where the climate is the major limitation to land use

LUC Units

The land use capability (represented by an Arabic number) *groups together those inventory units which require the same kind of management, the same kind and intensity of conservation treatment and are capable of growing the same kind of crops, pasture or forest species with about the same potential yield.*

For example, four areas of land might be classed as VIe3, VIe7, VIe12 and VIe16 respectively. All have the same broad degree of limitation (Class VI) and all have the same dominant type of limitation (subclass e). However, the units differ in the kinds of crops able to be grown and potential yields, or management or conservation techniques required for sustainable production. LUC units are only relevant to a particular regional survey, e.g. Taranaki–Manawatu, and cannot be compared across regions. Capability units are arranged in order of decreasing versatility and increasing limitation to use, e.g. VIIIE5 has a higher capability than VIIIE8 but not as high as VIIIE2.

Table 8: LUC Limitations vs Versatility

Class	Cropping Suitability	General Pastoral & Production Forestry Suitability	General Suitability
I	High	High	Multiple Use Land
II			
III	Medium		
IV	Low		
V		Medium	
VI	Unsuitable	Low	Pastoral or Forestry Land
VII		Catchment Protection land	
VIII			

Increasing Limitations to use
Decreasing versatility

Extended Legends

Each set of worksheets is accompanied by a set of extended legends that vary from region to region. These comprise tables of the physical data relating to each of the LUC units. Table 9 is an example of an extended legend for the Taranaki –Manawatu Region.

Examples of each of the LUC classes is shown on the STREAM site.

Table 9: Example of an LUC extended legend.

.UNIT	UNIT DESCRIPTION	PRESENT LAND USE	POTENTIAL LAND USE					
			GRAZING Carrying Capacity (SU/ha)			CROPPING	FORESTRY	EXOTIC FOREST GROWTH POTENTIAL (site index <i>P. radiata</i>)
			Present Average	Top farmer	Attainable physical potential			
IIw2	Flat river terraces with deep fertile soils which have a continuing slight wetness limitation after drainage. Unit occurs predominantly in the Manawatu but is widespread throughout the region	Intensive grazing, incl. Dairying. Horticulture incl. Vegetable cropping. Cereal cropping. Root and green fodder cropping.	19	25	30	Horticulture. Cereals. Root and green fodder crops.	Production	33-35

PASTURE FERTILISER REQUIREMENTS FOR SHEEP AND CATTLE GRAZING		ROCK TYPE	TYPICAL SOILS		
	MAINTENANCE				

INITIAL	At present average grazing capacity	At attainable physical potential grazing levels	Trace elements			NAME	Symbol	*Survey
600 kg/ha super-phosphate	250 kg/ha super-phosphate	400 kg/ha super-phosphate		Undifferentiated flood plain alluvium	AI	Gley Recent soils: Kairanga silt loam and clay loam Kairanga silt loam Kairanga fine sandy loam Kairanga heavy silt loam Gley soils: Te Arakura silt loam Te Arakura fine sandy loam Te Arakura sandy loam	2 K 4 K1 4b 8 8a 8b Te2	1 7 9 10 9 9 9 10
SLOPE	EROSION		VEGETATION	TYPE LOCALITY	SOIL CONSERVATION AND WATER MANAGEMENT MEASURES	ADDITIONAL COMMENTS		
	PRESENT	POTENTIAL						
A	Nil to slight streambank	Nil to slight streambank	High producing pasture. Cereals. Root and green fodder crops.	N149/070365 Intersection of Flyers Line and Gillespies Line.		Shelterbelts required for horticulture.		

