TARGET LAND AND LAND USE CAPABILITY CLASSES

Target Land is a mechanism enabling:

» identification of land most in need of erosion control treatment;
» a tool to rank tenders.

LABELLING THE LAND

Land use capability (LUC) units are used to classify the land. An LUC rating is an assessment of:

» rock type – mainly mudstone, argillite and greywacke in Gisborne East Coast;
» soil;
» slope – has groupings a-h where a is 0-3 degrees and h is > 42 degrees;
» present erosion severity;
» vegetation – there are five broad classes: grass, crops, scrub, forest and herbaceous;
» climate – broad factors are recognised such as at higher elevations cooler growing conditions prevail, rainfall generally exceeds 1800 mm/yr, soils are more strongly leached and important nutrients are less freely available;
» past land use;
» erosion potential; and
» the ability of these to provide sustainable agricultural production.

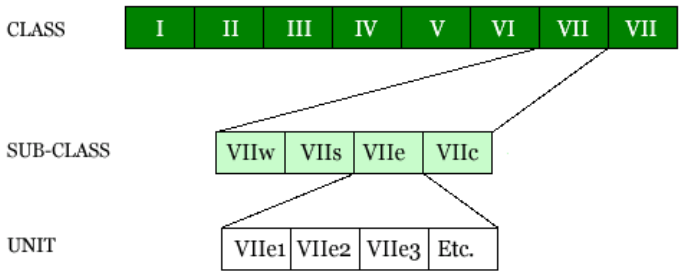
The individual LUC units are divided into eight broad classes (I-VIII) expressing the total degree of limitation to sustained use. Class I has negligible limitations (such as the Poverty Bay Flats) and Class VIII has extreme limitations (such as the Tarndale Slip).

Each Class is sub-divided expressing the dominant type of limitation on sustainable use. There are four sub-class limitations:

1. e – erosion
2. w – wetness
3. s – soils
4. c – climate

Prevailing on the East Coast, the dominant type of limitation to land sustaining agricultural production is erosion.

Finally, there is most detailed category the unit. The unit defines the assemblage of physical factors. Specifically, a LUC unit groups land that "responds similarly to the same management; adapts to the same kinds of crops, pasture or forest species; requires the same kind and intensity of soil conservation and other land management measures; yields to similar potentials".



LAND USE CAPABILITY CLASSES IN NEW ZEALAND

There are eight land use capability classes, four arable and four non-arable, arranged in order of increasing degree of limitation or hazard to use and in decreasing order of versatility of use, from one to eight.

Class I	Very good multiple-use land. Nearly level, has deep easily worked soils which are well drained but not seriously affected by drought and usually well supplied with plant nutrients and responsive to applied fertilisers. Climate is favourable for growth of wide range of cultivated crops/pasture/forestry. Practically no risk of erosion.
Class II	Good land with slight limitations. Management/conservation practices to overcome these limitations are easy to apply. Land used for cultivated crops/ pasture/forestry. Limitations occur singly or combined: (a) slight to moderate susceptibility to erosion (b) gentle slopes (c) soils of only moderate depth (d) wetness, existing permanently as a slight limitation after drainage (e) occasional damaging overflow (f) unfavourable structure and difficulty in working (g) slight to moderate salinity (h) slight climatic limitations.
Class III	Moderate limitations restricting choice of plants grown and/or make special conservation practices necessary. May be used for cultivated crops/pasture/ forestry. Limitation result from one or more of the following: (a) moderate to high susceptibility to erosion or severe effects of past erosion (b) rolling slopes (c) shallow soils (d) wetness or continued waterlogging after drainage (e) frequent damaging overflow (f) low moisture holding capacity (g) moderate salinity (h) moderate climatic limitations (i) low fertility, not easily corrected.
Class IV	Severe limitations to arable use restricting choice of crops grown and/or necessitate intensive conservation treatment and/or very careful management. Land kept in pasture for long periods with cash for cropping should be restricted to, say, once in five years or less frequently. Limiting features occurring alone or in combination: (a) high susceptibility to erosion or very severe effects of past erosion (b) strongly rolling slopes (c) very shallow soils (d) excessive wetness with continuing hazard of waterlogging after drainage (e) frequent overflow with severe damage (f) very low moisture holding capacity (g) high salinity (h) severe climatic limitations (i) low fertility very difficult to correct
Class V	No Class V on East Coast
Class VI	Fairly good stable hill country where soil erosion can be minimised by good pasture establishment/management. Also includes flat rolling land with an erosion risk or other limitation too great to allow safe cropping use but which has moderate limitations/hazards under a perennial vegetation. Usually well suited to grazing/forestry. Soils responsive to fertiliser. Limitations are (usually in combination): (a) slight to moderate erosion hazard under perennial vegetation (b) steep/very steep slopes (c) very stony/very shallow soils (d) excessive wetness or overflow (e) frequent flooding with severe damage to pastures (f) low moisture holding capacity (g) severe salinity (h) moderate climatic limitations.
Class VII	Unsuitable for arable use and has severe limitations/hazards under perennial vegetation. Usually not suited for grazing, as it requires special soil conservation practices, moderately well suited to forestry. Limitations are similar to Class VI but are intensified. Limitations are usually in combination: (a) severe erosion hazards or severe effects of past erosion (b) very steep slopes (c) very stony/very shallow soils (d) extreme wetness of soils (e) very frequent damaging flooding (f) very erodible rock type (g) very high salinity (h) severe climatic limitations (i) very low moisture holding capacity (j) low fertility, very difficult to correct.
Class VIII	Predominantly very steep mountain land, mostly above 4000 ft, descending to lower levels in unfavourable situations and on very steep land in high rainfall areas. Most common limitation is extreme erosion or erosion hazard which may be combined with severe limitations of climate or low fertility. Management for pastoral/forestry production not very commercial as it will be increasingly necessary to give protection for plant growth for on- and, particularly, off-site benefits. Therefore, unsuitable for pasture or commercial forestry. Use is restricted to catchment protection and recreation.

Land use capability units are unique to their region. For example VIe2 in the Waikato region is specific to that region and differs from VIe2 in the Gisborne-East Coast region.

Land use capability units are grouped into three categories and further divided into sub-categories.

Category	Sub-Category	LUC Unit
1	a	All of Class I, Class II, and Class III
1	b	All of Class IV, Class V, and Class VI
2	a & b	All remaining Class VII
3	a	VIIe15, VIIe16, VIIe17,
3	b	VIIe18, VIIe21, VIIe23, VIIe25
3	c	VIIe19, VIIe22, VIIe24
4		All Class VIII

HISTORY OF TARGET LAND

In 1992 there was no targeting mechanism for the ECFP. Grants were paid on all Class VII land content in accepted tenders.

Following the inaugural year of the ECFP, it was accepted that with no targeting mechanism land that could be used sustainably in agriculture might go into trees under the ECFP, which was not an objective. It was, therefore, that in 1993 Target Land was introduced to focus the erosion control treatments primarily on land that could not be sustainably utilised in agriculture.

From 1993 to 1999 the Target Land was classified as severely eroding category 2 land and category 3 land.

The year 1999 saw the completion of the review of the ECFP. One of the outcomes of the review was to re-classify Target Land. Today Target Land is category 3b and 3c land and some category four land that does not have a closed canopy cover.

VIIe 18, 19, 21, 22, 23, 24, 25

VIIIe 3, 4, 5, 6, 7, 8, 9

Unit	Predominant Erosion	Unit Description
VIIe18	Earthflow	Rolling to strongly rolling* slopes on crushed argillite and sheared mixed lithologies where rainfall is >2000mm, and with a potential for very severe earthflow erosion (mainly north-west of the Waiapu River valley). At larger scales (1-2ha) the unit is characterised by poorly drained broken/ hummocky ground with active/fresh shear lines along the boundary of more relatively stable land, and where pastures are modified by dense rush vegetation. This unit isn't to be mistaken with wet boggy springs/patches that exist simply due to topographic position.
VIIe19	Earthflow	This unit is similar to VIIe18, on crushed argillite and sheared mixed lithologies, except that it is not restricted to areas where annual rainfall is >2000mm. This unit has slightly steeper slopes, and have more pronounced fully erosion, where the gullies are more severe the VIIe24 unit is used.
VIIe21	Gully and soil slip	Strongly rolling to moderately steep slopes on unstable frittered (so called 'loose jointed') mudstone hill country. This unit is characterised by an eroding watercourse destabilising steepened sides causing soil slips and some earthflows along the gully edge.
VIIe22	Gully	Moderately steep to very steep slopes on crushed greywacke, mainly in the Raukumara Range and foothills. This unit is characterised by long slopes, closely dissected by quite shallow gullies, with associated earthflows and slumps. Earthflows become important where annual rainfall is >2000mm.
VIIe23	Soil Slip, Gully	Steep to very steep slopes, in bedded, frittered, or massive mudstone hill country that is mostly severely eroded by numerous slips. These have largely coalesced (joined together) to expose considerable areas of bare ground, sometimes forming very steep-sided gullies with eroding channels at their base.
VIIe24	Gully	Steep to moderately steep slopes in mainly crushed argillite hill country, usually with actively eroding amphitheatre-like (large) gullies. Use VIIIe9 where the entire area of the fully form is without associated uneroded hill country.
VIIe25	Earthflow	Strongly rolling to moderately steep slopes in bentonite hill country. This unit occurs in 'melange zones', found between boundaries of different major rock types. This unit is characterised by very poorly drained soils and slopes with creeping earthflows and slumps.
VIIIe3-9		These units are recognised as having potential for very severe to extreme erosion, e.g., VIIIe9 is recorded in the Tarndale slip, Bartons Gully (Wairongomai) etc. they also include very steep to precipitous slopes in gorges or riverside cliffs, and very steep to precipitous slopes on mountain land.

TargetlandVIIe24

Severe gully erosion on argillite hill country in the Tapuaeroa Valley. The eroding gully units generally have an associated watercourse, which as it cuts down destabilises the edges leading to slump, earthflow and gully edge collapse.

Gully erosion with associated earthflow (top end) and slumping (along the gully edges). (This area would have been mapped as VIIe19 before the watercourse "cut down" causing the gully to become the prominent erosion form).

TargetlandVIIe21

Gully and slip erosion

Severe erosion with some slump and slip characteristics.

Severe large-scale slump caused by a two-fold effect. The watercourse has destabilised the hill slope toe; rainwater saturation of the hill slope has overloaded it and the slope has failed due to it's own shear weight. The only remedial option here would be to afforest this area to a practical boundary.

Numerous small gullies eroding into a larger watercourse. Also noticeable slip and slump erosion.

Severe gully erosion, almost all “target land” planted in radiata pine.

Gully erosion. The downcutting of the watercourse has destabilised the slope edges causing slip and slump damage.

Approximately half of this face is slump and slip erosion, again cause by an eroding watercourse. The type of erosion could have been avoided with appropriately planted willow or poplar poles.

Severe slip and slump erosion; the land has been destabilised by the eroding watercourse.

Gully erosion with scattered scrub, still “target land” under the ECFP.

Slump erosion caused by the eroding watercourse destabilising the toe of the hill.

Not Target Land

This type of erosion is common after heavy rainfall events. Although the erosion can be very severe it is also common in other regions of the country. Central Government funding cannot be justified for use on this type of erosion. The East Coast Forestry Project concentrates on the erosion types unique to the East Coast.

TargetlandVIIe23

Severe gully erosion with associated soil slip erosion on massive mudstone hill country. This unit is characterised by very steep slopes slipping away into an almost gorge-like gully.

TargetlandVIIe19

Earthflow erosion. Note the characteristic broken, flowing appearance. It is covered in rushes.

Large scale earthflow erosion; the majority of this photo would be mapped as target land.

Severe earthflow erosion. It is recognised by the broken flowing appearance in the centre of the Class VII land. The surrounding land is more stable, has a smoother appearance and would be mapped as Class VI land.

Source: Table and photos as courtesy of the Gisborne District Council, Soil Conservation Section, Conservation Quorum Spring 2000.