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Reporting on research evidence and policy

Integrating the FARMLUC classification into planning and policy decision-making

Broadly speaking, the land use capability (LUC) classification describes eight classes of land across New Zealand[1]. The versatility of the land decreases as you move from LUC class 1 through the scale towards class 8.

LUC class 1 land is defined as being highly versatile with negligible physical limitations for arable or rural farming use, whereas LUC class 8 is classified as land which has very severe to extreme physical limitations making it unsuited to agricultural, horticultural or plantation forestry use.

The New Zealand Land Resource Inventory (NZLRI) represents the national LUC unit coverage and comprises mapping from between 1973 and 1979. These maps were first digitised in 1981 (at a scale of 1:63,360) and subsequent editions followed at a scale of 1:50,000[2].

A LUC unit for each polygon of land mapped is predominantly based on an inventory of rock type, soil type, slope, erosion susceptibility, vegetation and climate. The NZLRI splits the country into 11 regions and each region will have a separate LUC classification. The Auckland region has previously been divided into three parts. This has presented inconsistencies across the region between, for example, how different LUC units are mapped on similar soils across Auckland.

A new LUC classification for Auckland has now been developed to address these issues. It is known as FARMLUC and will provide a regionally consistent, robust and more detailed LUC classification for the region than the previously available NZLRI LUC classification.

The FARMLUC classification[3] remains interchangeable with the regional-scale (1:50,000) NZLRI LUC layer in GEOMAPS (Auckland Council's GIS: see GEOMAPS – NZLRILUC – FARMLUC conversion layer) so LUC units can still be compared across the two classification systems.

Additionally, when farm plans are implemented on properties at the farm-scale (1:5,000-1:10,000) information contained in the FARMLUC classification will provide more information to support land management decision-making by advising landowners about sustaining current use, reducing environmental impact and improving productivity.

Differences between the NZLRI LUC and FARMLUC classifications are also particularly relevant when considering matters associated with elite and prime soils in Auckland.

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Key findings

The FARMLUC classification system has revealed that some classes of land are not as they initially appeared to be at the NZLRI regional scale. For example, the NZLRI shows that LUC class 1 and class 5 land appeared limited at the 1:50,000 scale (Table 1 and Figure 1A). However, these areas of land are more extensive when using FARMLUC at the same scale.

These increases effectively saw a decrease in land that was previously mapped as LUC class 2 and 6 land, respectively, under the NZLRI (Table 1 and Figure 1B).

The distribution differences between these classes of land across the two classifications is outlined in more detail in technical report TR2017/016[3] but in summary, it was considered that these areas of land better meet the definition of class 1 and 5 land according to the *Land use capability survey handbook* 2009[1].

Table 1. Breakdown of LUC classes 1 to 8 in hectares and percentage between the NZLRI and FARMLUC classifications in Auckland.

	NZLRI		FARMLUC	
LUC class	Hectares	% of region	Hectares	% of region
1	4397	1	21,011	5
2	55,356	12	38,606	9
3	65,090	15	63,827	14
4	79,641	18	79,975	18
5	0	0	51,959	12
6	174,067	39	122,589	28
7	52,420	12	55,596	13
8	12,886	3	10,415	2

Elite and prime soils

From a planning and policy perspective this is important because in the Auckland Unitary Plan (AUP), LUC class 1 is defined as land containing elite soils and LUC classes 2-3 as land containing prime soils.

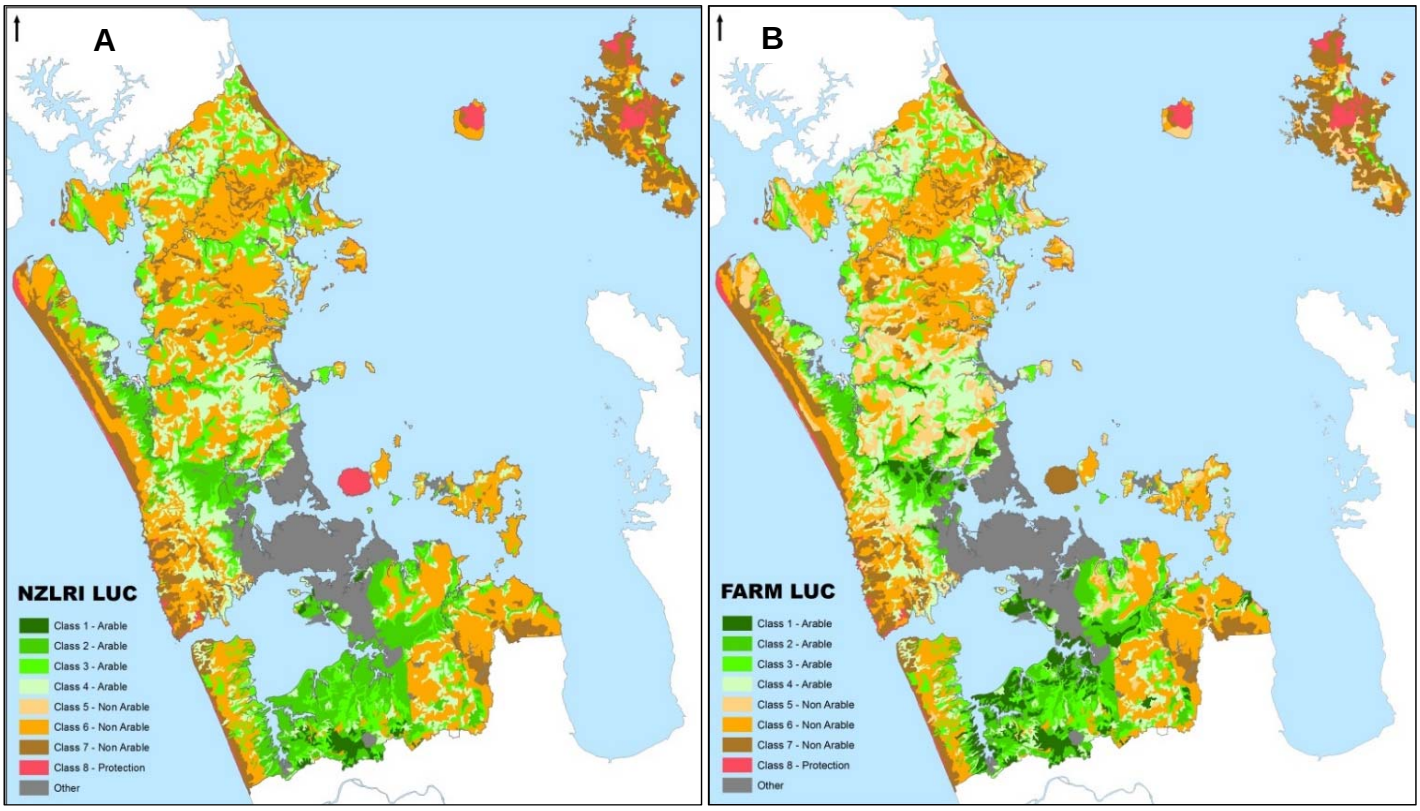

Figure 1. Distribution of LUC classes 1 to 8 according to (A) the NZLRI LUC and (B) FARMLUC classifications with the predominant difference being the increase in LUC class 1 and 5 land in FARMLUC.

However, elite and prime soils are not afforded the same level of protection in the plan; the word ‘avoid’ is associated with land containing elite soils in relation to development but ‘avoid where practicable’ when looking at land containing prime soils’ (e.g. see AUP Policy B.9.4.2 (4) C and D).

A new LUC classification

The FARMLUC classification retains the NZLRI LUC classes 1 to 8, but replaces four sub-classes (indicating general limitations to land use) with twenty specific sub-classes, and replaces unit numbers (denoting different kinds of land but three inconsistent number sets) with a single set of character suffixes. For example, the sub-classes of the NZLRI and FARMLUC classifications are listed in Table 2.

Table 2. Comparison of NZLRI and FARMLUC classification sub-classes.

NZLRI	FARM LUC	Description
Climate and slope		
c	c	Climate constrains crop, grass or tree growth, any other limitations are negligible
c	s	Slope shape or contour precludes cultivation, slope elev constrains crop, grass or tree growth, any other limitatio negligible
Soil		
s	r	surface stones or rock outcrops
s	p	poor subsoil structure or subsoil pan
s	n	nutrient deficiency
s	a	salinity
s	y	toxicity
Drainage and wetness		
w	x	excessively free-draining
w	w	imperfectly draining or impeded drainage
w	f	flooding (occasional, regular or frequent)
w	o	over-drainage and/or oxidation of peat
Deposition and erosion		
e	e	alluvial or colluvial sediment deposits
e	t	sheetwash or windblow (exposed topsoil)
e	d	blow-outs and dunes (sand)
e	o	scree (stony slope deposits)
e	b	streambank collapses
e	g	gullies (including under-runners)
e	u	slumps or earthflows
e	l	landslides or debris avalanches
e	k	rockfalls

It is also worth noting that production data (e.g. tonnes of dry matter yield per hectare per year) using long-term pasture field trials that were conducted across representative land and soil characteristics and rainfall data in Auckland, were used to estimate the productive potential of FARMLUC units for the region. This is outlined in technical report TR2017/020[4] and is also available on GEOMAPS. While production estimates are also available in the NZLRI LUC classification, they were based on practitioner observations and are subject to some degree of observer bias or subjectivity. This reinforces the preference of the FARMLUC classification over the NZLRI for Auckland.

Integrating the FARMLUC classification into planning and policy decision-making

It is recommended that FARMLUC information displayed in GEOMAPS under ‘NZLRI LUC-FARMLUC conversion layer’ takes precedence over what is displayed according to the NZLRI LUC classification as it is regionally consistent which utilises more robust production data and is also able to withstand close scrutiny in the New Zealand legal system. For example, information according to the FARMLUC classification was recently applied when conducting farm-scale mapping as part of a recent AUP Environment Court Appeals hearing (See *OurAuckland*, 23 April 2018 Environment Court decision protects Crater Hill and Pūkaki Peninsula).

The Environment Court decision found in favour of Auckland Council, which amongst other outcomes, saw the continued protection of elite soils in and around the Pūkaki Peninsula.

In the absence of an area or site specific assessment, the best LUC data available for Auckland is the FARMLUC layer in GEOMAPS. However, similarly to how the information in the NZLRI has been previously utilised and interpreted, it is very important that the GEOMAPS operator is aware that the FARMLUC geospatial layer depicts the main FARMLUC class/subclass/suffix within each 1:50,000 NZLRI polygon only.

Other FARMLUC classes/subclasses/suffixes are present within each polygon but the 1:50,000 scale does not indicate their presence or extent so any map printed from it will only be suitable for illustrative purposes. Therefore such a map would not be suitable when dealing with a particular property.

To find out information for a particular property it is necessary to field-map FARMLUC at the 1:5,000-1:10,000 scale. This should be undertaken by a suitably qualified LUC practitioner as per AUP rule E39.6.4.7(1) D and in accordance to standard procedures.[1, 5]

Auckland Council staff should continue to use and integrate the FARMLUC classification – particularly information relevant to elite and prime soils – when considering future planning and policy decision-making across the region.

References

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