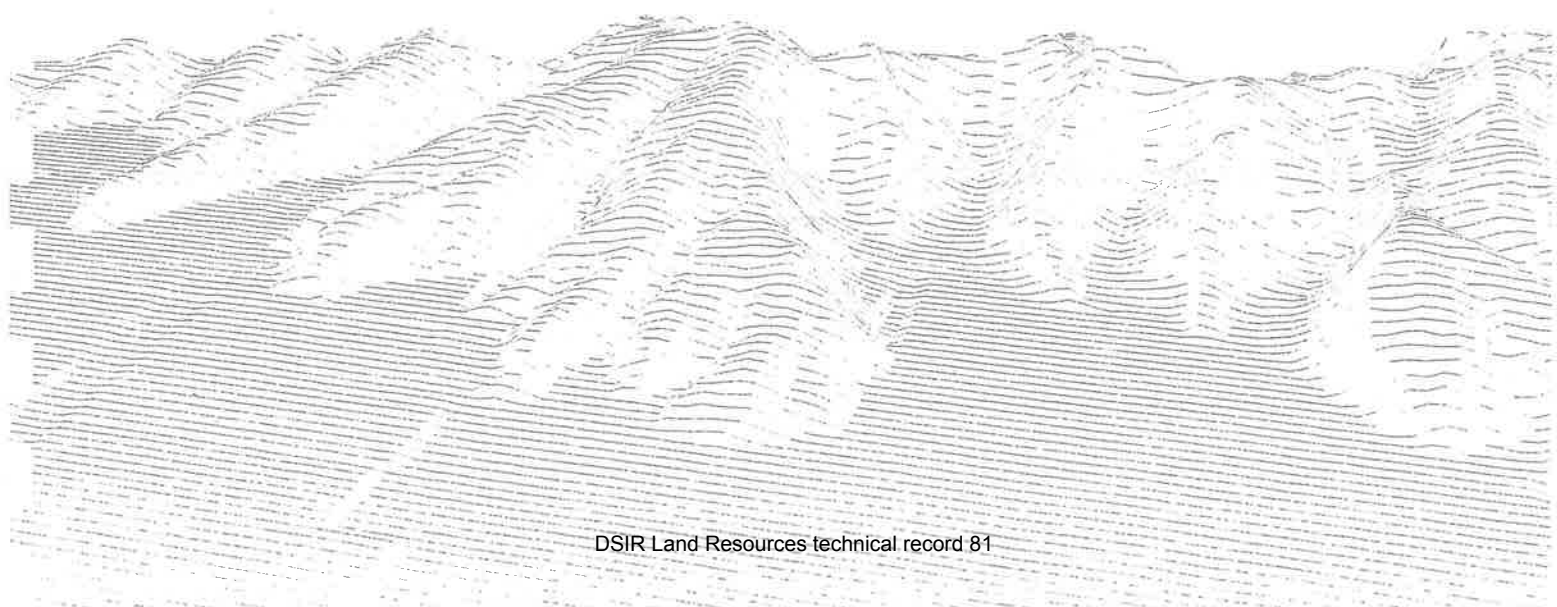




Manaaki Whenua
Landcare Research
NEW ZEALAND LTD

New Zealand Land Resource Inventory Arc/Info Data Manual Edition 1, May 1992

P.F.J. Newsome



NEW ZEALAND LAND RESOURCE INVENTORY
ARC/INFO DATA MANUAL
EDITION 1, MAY 1992

P.F.J. Newsome

DSIR Land Resources

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DSIR Land Resources

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Typed by Tessa Roach

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1. INTRODUCTION

The New Zealand Land Resource Inventory (NZLRI), is the principal, but not the only, spatial database held on the DSIR, Land Resources, Geographic Information System. Other spatial databases include:

- The Vegetative Cover Map of New Zealand (1:000 000 scale)
- A digital topographic database (1:250 000 scale), held under licence from the Department of Survey and Land Information.
- Various administrative and natural boundary databases (various scales).
- Various soil survey's (various scales).

The NZLRI is however the database which nationally has the greatest coverage (all New Zealand except Stewart Island and outlying islands), at the largest scale (1:63 360-1:50 000), mapping the largest number of attributes (refer overleaf) to nationally consistent standards and classifications. It therefore forms a valuable resource management and planning tool in national to local applications and the spatial vehicle for expression of more detailed textural databases, such as, for example, the National Soils Database.

2. THE NEW ZEALAND LAND RESOURCE INVENTORY (NZLRI)

The NZLRI database was digitised, between 1977 and 1980, from the New Zealand Land Resource Inventory maps (NWASCO 1975-79). These maps are at a scale of 1:63,360 and are compiled on the NZMS 1 topographic map series. The database consists of a total of about 85,000 map units (with a median size over New Zealand of 153 ha) and their physical resource descriptions.

The data were collected between 1973 and 1979 from detailed aerial photo-interpretation, large scale resource maps and extensive field work.

Since the publication of the 1st edition NZLRI, a remapping programme has resulted in 2nd edition coverage for the South Auckland, Northland, Wairau/Awatere, and Wellington regions. The South Auckland region was remapped at 1:63,360 scale on NZMS 1 sheets, while the remainder were compiled on 1:50,000 scale NZMS 260 (metric) topographic sheets.

2.1 ATTRIBUTES

The core data description is made up of 6 items; Rock, Soil, Slope, Erosion, Vegetation, and land Use Capability. These items are called on the database; ROCK, SOIL, SLOPE, EROSION, VEG, LUC respectively. During the course of digitising three other items were recorded, namely; LEGEND, ISLAND, and TYPE.

Once the maps had been digitised other items were added. These include Stock Carrying Capacity (CCAV, CCTO, CCPO), *Pinus radiata* Site Index (PRSIC, PRSIR, PRSIAV), and Phosphate Requirements (PHAAV, PHATO, PHAPO, PSUAV, PSUTO, PSUPO). In addition further items were added to correlate between, or to generalise, existing items. These include LUC correlation units (LCORR), Basement rock (BASEROCK), Surface rock (TOPROCK), Dominant soil (DOMSOI), equivalent '4-mile' soil (GENSOI), and equivalent soil group (NZGSOIGRP).

2.1.1 Pre-declared Items

NAME	DESCRIPTION	WIDTH ¹	OUTPUT ¹	TYPE	N.DEC ¹
area	area in map units	4 (8)	12 (18)	f	3 (5)
perimeter	perimeter in map units	4 (8)	12 (18)	f	3 (5)
cover#	coverage internal id	4	5	b	0
cover-id	coverage user id	4	5	b	0
legend	NZLRI region number	2	2	c	-
luc	land use capability	9	9	c	-
rock	rock type (ed 1)	16	16	c	-
rock2	rock type (ed 2)	16	16	c	-
soil	soil unit	23	23	c	-
slope	slope	11	11	c	-
erosion	erosion degree & type	12	12	c	-
veg	vegetation cover (ed 1)	20	20	c	-
veg2	vegetation cover (ed 2)	20	20	c	-
type	map unit type	1	1	c	-
areah	area in hectares	4	12	f	2
(indexed to LUC)					
lcorr	N I luc correlation unit	5	5	c	-
ccav	stock units/ha (av)	4	4	n	1
ccto	stock units/ha (top)	4	4	n	1
ccpo	stock units/ha (pot)	4	4	n	1
prsic	P. rad site index class	7	7	c	-
prsir	P. rad site index range	6	6	c	-
prsiav	P. rad site ind average	2	2	i	-
(indexed to rock)					
toprock	surface rock type	3	3	c	-
baserock	basement rock type	3	3	c	-
(indexed to soil)					
domsoi	dominant soil type	9	9	c	-
gensoi	equiv '4-mile' soil	5	5	c	-
nzgsoigrp	equiv soil group	10	10	c	-
(indexed to LUC, soil, slope)					
phaav	Phos req (av su) (kg/ha)	2	2	i	-
phato	Phos req (top su) (kg/ha)	2	2	i	-
phapo	Phos req (pot su) (kg/ha)	2	2	i	-
psuav	Phos req (av su) (kg.su)	4	4	n	1
psuto	Phos req (top su) (kg/su)	4	4	n	1
psupo	Phos req (pot su) (kg/su)	4	4	n	1
edition	NZLRI mapping edition	3	3	c	-
polyid	Unique polygon identifier	8	8	i	-

¹ Values in parentheses apply to double precision coverages (recommended for metric NZLRI)

AREA

AREA is a 12 character, floating point item giving the AREA OF THE POLYGON IN COVERAGE UNITS. Coverage units are meters (note American spelling) for metric versions of the NZLRI, or yards on the original (imperial) version of the NZLRI.

AREA is a system item which is automatically initialised by ARC/INFO and which is updated by ARC during processes which change topology.

The .PAT item definition for AREA is as follows:

Item name	Item width ¹	Output width ¹	Item type	No. of decimals ¹
AREA	4 (8)	12 (18)	f	3 (5)

¹ Values in parentheses apply to double precision coverages (recommended for metric NZLRI)

PERIMETER

PERIMETER is a 12 character, floating point item giving the PERIMETER OF THE POLYGON IN COVERAGE UNITS. Coverage units are meters (note American spelling) for metric versions of the NZLRI, or yards on the original (imperial) version of the NZLRI.

PERIMETER is a system item which is automatically initialised by ARC/INFO and which is updated by ARC during processes which change topology.

The .PAT item definition for PERIMETER is as follows:

Item name	Item width ¹	Output width ¹	Item type	No. of decimals ¹
PERIMETER	4 (8)	12 (18)	f	3 (5)

¹ Values in parentheses apply to double precision coverages (recommended for metric NZLRI)

COVER#

COVER# (where 'cover' is the coverage name) is a 5 character, binary integer item giving the POLYGON INTERNAL NUMBER. (This number is the reference for the LPOLY# and RPOLY# items in the .AAT)

COVER# is a system item which is automatically initialised by ARC/INFO when the coverage is 'built', and is updated by ARC during processes which change topology.

The .PAT item definition for COVER# is as follows:

Item name	Item width	Output width	Item type	No. of decimals
COVER	4	5	b	-

COVER-ID

COVER-ID (where 'cover' is the coverage name) is a 5 character, binary integer item giving the POLYGON USER NUMBER. This number can be altered by the user and will commonly have a value of 'COVER# - 1' (i.e. one less than the COVER#).

COVER-ID is a system item which is automatically initialised by ARC/INFO when the coverage is 'built'.

The .PAT item definition for COVER-ID is as follows:

Item name	Item width	Output width	Item type	No. of decimals
COVER-ID	4	5	b	-

LEGEND

LEGEND is a 2 character, right justified, item giving the number of the NZLRI Survey Region in which the map unit lies. Since each Survey Region has a unique Land Use Capability classification, LEGEND is essential if one is to correctly define LUC Units.

The meaning of the values are as follows:

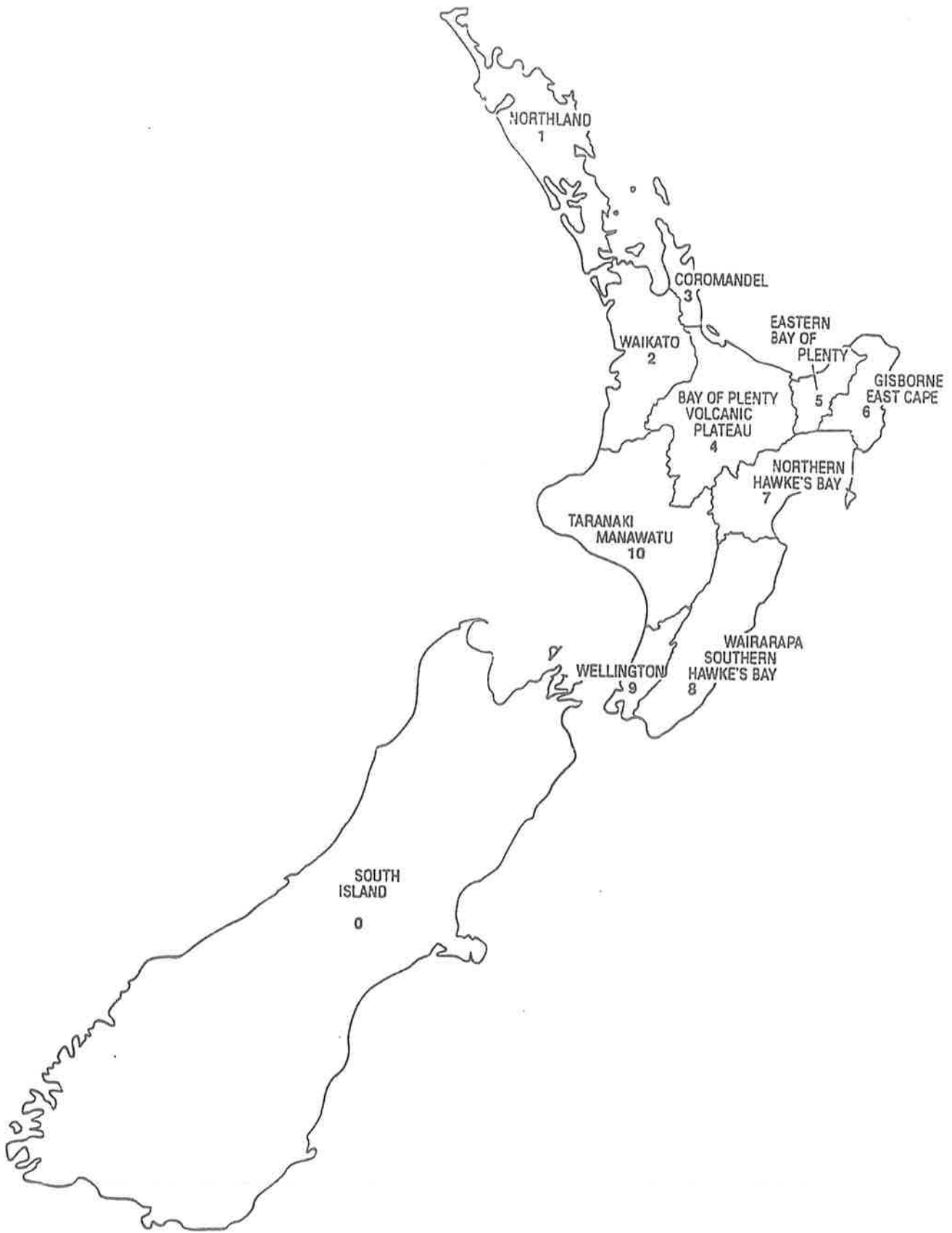
00	South Island
01	Northland
02	Waikato
03	Coromandel - Great Barrier
04	Bay of Plenty - Volcanic Plateau
05	Eastern Bay of Plenty
06	Gisborne - East Cape
07	Northern Hawkes Bay
08	Wairarapa - Southern Hawkes Bay
09	Wellington
10	Taranaki - Manawatu

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The Geographic extent of these Regions is shown on the map overleaf

The .PAT item definition for LEGEND is as follows:

Item name	Item width	Output width	Item type	No. of decimals
LEGEND	2	2	c	-



New Zealand Land Resource Inventory survey regions and LEGEND numbers

LUC

LUC is a 9 character item made up of a dominant Land Use Capability assessment and (sometimes) a subdominant Land Use Capability. Its format is as follows:

where | csuu+csuu |
 c = LUC class (Roman Numerals on printed maps)
 s = LUC subclass modifier
 uu = LUC unit identifying number

eg. 4e15+3w 1 - the dominant LUC is 4e15 and the subdominant LUC is 3w1.
 - the LUC classes are 4 and 3
 - the LUC subclasses are 4e and 3w
 - the LUC units are 4e15 and 3w1

The values for class, subclass modifier, and unit identifier are explained as follows:

LUC Class Suitability	1 2 3 4 arable	5 6 7 non arable	8 protection	
LUC 'Subclass' Major Limitation	c climate	e erosion	s soil	w wetness
LUC 'Unit'	1 2 3 4 5 ... associates, ranks, and describes units with similar landform, potential, limitations, and behaviour			

The detailed meaning of a LUC unit is dependent on the NZLRI Survey Region in which it lies. New Zealand has been divided into 10 Survey Regions. The Region in which a map unit lies is specified in the item LEGEND. Each LUC Unit is described in detail in the Regional Extended Legend which accompanies the maps. These descriptions may be amplified in a Regional Bulletin. The Extended Legends briefly characterise each LUC unit in terms of its physiography, land use, potential erosion, and aspects of productivity and management. The Regional Bulletins compare the various LUC units and relate them to each other, as well as giving photographic descriptions of each.

Normal units (TYPE = n) have a LUC value

Non-normal units have the following values:

estu -for TYPE = e (estuaries)
 ice -for TYPE = i (ice)
 lake -for TYPE = l (lake)
 quar -for TYPE = q (quarry/mine)
 rive -for TYPE = r (river)
 town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for LUC is as follows:

Item name	Item width	Output width	Item type	No. of decimals
LUC	9	9	c	-

ROCK

ROCK is a 16 character, left justified, unformatted item. The Rock item is made up of the rock types as described in the tables overleaf and the following qualifying symbols:

() + / '

' indicates deep weathering (North Island only) eq. Vo'

+ indicates a combination of rock types eg. Lo+Al

() indicates significant in patches eg. (Al)

/ indicates stratigraphic succession, surface rock first.

eg. Lo/Gw

eg. (Lo)+Al/Gw

The values of the first edition rock type symbols appear on the following pages.

To maintain a level of national consistency all coverages in the NZLRI have both a ROCK item and a ROCK2 item. Areas covered by 2nd edition mapping have had their ROCK2 recording correlated back to ROCK notation so rock type information can be accessed in either format from the respective item. The ROCK notation, however, remains the only nationally consistent one and so must be used for analyses which include edition 1 areas. Areas covered only by edition 1 mapping have blank records in the ROCK2 item.

Normal units have a ROCK value

Non-normal units have the following values:

estu -for TYPE = e (estuaries)

ice -for TYPE = i (ice)

lake -for TYPE = l (lake)

quar -for TYPE = q (quarry/mine)

rive -for TYPE = r (river)

town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for ROCK is as follows

Item name	Item width	Output width	Item type	No. of decimals
ROCK	16	16	c	-

THE NORTH ISLAND ROCK TYPE CLASSIFICATION (Edition 1)

I IGNEOUS ROCK TYPES

- / Ng Ngauruhoe ash
- / Ta Tarawera Ash and Lapilli
- / Rm Rotomahana Mud
- / Kt Kaharoa and Taupo ashes
- / Mo Ashes older than Taupo Pumice
- / Lp Lapilli
- / Tp Taupo and Kaharoa breccia and volcanic alluvium
- / Ft Breccias older than Taupo breccia
- / La Lahar deposits
- * / Sc Scoria
- / Vo Lavas, ignimbrite and other 'hard' volcanic rocks
- * / Vu 'Soft' volcanic rocks
- / Gn Crystalline intrusive rocks
- * / Um Ultramafic rocks

II SEDIMENTARY ROCK TYPES

- / Pt Peat
- / Lo Loess
- / Wb Sands — windblown
- / Gr Gravels
- / Al Undifferentiated floodplain alluvium
- / Us Unconsolidated to moderately consolidated clays, silts, sands, tephra and breccias
- / Mm Mudstone or fine siltstone — massive
- / Mb Mudstone or fine siltstone — banded
- / Mj Mudstone or fine siltstone — jointed
- / Me Mudstone — bentonitic
- / Sm Sandstone or coarse siltstone — massive
- / Sb Sandstone or fine siltstone — jointed
- / Me Mudstone — bentonitic
- / Sm Sandstone or coarse siltstone — massive
- / Sb Sandstone or coarse siltstone — banded
- * / Cg Conglomerate and breccia
- / Ar Argillite
- / Ac Argillite — crushed
- / Gw Greywacke
- / Li Limestone

Notes:

- * These rock types do not appear on the worksheets but are recorded in the computer data base.

Ac
Lst
Gw

2. Worksheets printed prior to 1977 contain time-stratigraphic and other symbols from published geological maps instead of the above symbols (see Crippen and Eyles 1985). The computer database, however, records only the rock type symbols above.
3. Changes to the classification have occurred during the survey (see Crippen and Eyles 1985).
4. For a more detailed description of the classification refer to Crippen and Eyles 1985.

THE SOUTH ISLAND NZLRI ROCK TYPE CLASSIFICATION (Edition 1)

- I SURFICIAL ROCK TYPES
- Al Alluvium, colluvium, glacial drift
 - Wb Windblown sand
 - Lo Loess
 - Pt Peat
- II SEDIMENTARY ROCK TYPES
- WEAKLY INDURATED SEDIMENTARY ROCKS
- Ms Mudstone
 - Ss Sandstone
 - Fy Interbedded sandstone and mudstone
 - Cw Conglomerate
- STRONGLY INDURATED SEDIMENTARY ROCKS
- Ar Argillite
 - Hs Sandstone
 - Gw Greywacke
 - Cg Conglomerate
 - Ls Limestone
- III IGNEOUS ROCK TYPES
- Tb Pyroclastics (ash and lapilli)
 - Vo Lavas
 - In Ancient volcanoes, minor intrusives (dikes and sills)
 - Gn Plutonics
 - Um Ultramafics
- IV METAMORPHIC ROCK TYPES
- St1 Semi-schist
 - St2 Schist
 - Gs Gneiss
 - Ma Marble

Notes:

For a more detailed description of this classification refer to Lynn 1985.

ROCK2

ROCK2 is a 16 character left justified unformatted item.

In second edition NZLRI sheets the rock classification and notation was modified. The ROCK2 item is made up of the rock types as described in the table overleaf and the following qualifying symbols:

- w indicates deep weathering eq. wVo
- p indicates significant in patches eg. pAl
- * used in conjunction with /, indicated that the rock types linked by the * are both overlain by the preceding rock type. eg Lo/Sm*Li, Loess overlying both Massive sandstone AND Limestone. (This contrasts with Lo/Sm+Li where the Loess overlies Sm only
- + indicates a combination of rock types
- / indicates stratigraphic succession, surface rock first.

eg. pLo+Al/Gw

The values of the second edition rock type symbols together with their correlations back to the first edition classifications appear overleaf.

To maintain a level of national consistency all coverages in the NZLRI have both a ROC item and a ROCK2 item. Areas covered by 2nd edition mapping have had their ROCK2 recording correlated back to ROCK notation so that rock type information can be accessed in either format from the respective item. The ROCK notation, however, remains the only nationally consistent one and so must be used for analyses which include edition 1 areas. Areas covered only by edition 1 mapping have blank records in the ROCK2 item.

Normal units have a ROCK2 value

Non-normal units have the following values:

- estu -for TYPE = e (estuaries)
- ice -for TYPE = i (ice)
- lake -for TYPE = l (lake)
- quar -for TYPE = q (quarry/mine)
- rive -for TYPE = r (river)
- town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY AND THOSE AREAS COVERED ONLY BY EDITION 1 MAPPING.

The .PAT item definition for ROCK2 is as follows

Item name	Item width	Output width	Item type	No. of decimals
ROCK2	16	16	c	-

NZLRI ROCK TYPE CLASSIFICATION (Edition 2)

2nd Edition		1st Edition	
		North Island	South Island
A. IGNEOUS ROCKS			
(i) extremely weak to very weak igneous rocks			
Ng	Ngauruhoe tephra	Ng	-
Rm	Rotomahana mud	Rm	-
Ta	Tarawera tephra	Ta	-
Sc	Scoria	Sc	-
Lp	Pumiceous lapilli	Lp	-
Kt	Kaharoa & Kaharoa breccia & pumiceous alluvium	Tp	-
Mo	Ashes older than Taupo ash	Mo	-
Ft	Quaternary breccias older than Taupo breccia	Ft	-
La	Lahar deposits	La	-
Vu	Extremely weak altered volcanics	Vu	-
(ii) weak to extremely strong igneous rocks			
Vo	Lavas & welded ignimbrites	Vo	Vo
Tb	Indurated fine-grained pyroclastics	Vo	Tb
Vb	Indurated volcanic breccias	Vo	Tb
In	Ancient volcanics	Vo	In
Gn	Plutonics	Gn	Gn
Um	Ultramafics	Um	Um

2nd Edition		1st Edition	
		North Island	South Island
B. SEDIMENTARY ROCKS			
(i) very loose to compact (very soft to stiff) ^ sedimentary rocks			
Pt	Peat	Pt	Pt
Lo	Loess	Lo	Lo
Wb	Windblown sand	Wb	Wb
Al	Fine alluvium	Al	Al
Gr	Alluvium gravels	Gr	Al
Cl	Coarse slope deposits	Gr	Al
Gl	Glacial till	-	Al
Uf	Unconsolidated clays & silts	Us	-
Us	Unconsolidated sands & gravels	Us	-
(ii) very compact (very stiff) to weak sedimentary rocks			
Mm	Massive mudstone	Mm	Ms
Mb	Bedded mudstone	Mb	Fy
Mf	Frittered mudstone or Mj Jointed mudstone	Mj	Ms
Me	Bentonitic mudstone	Mj	Ms
Sm	Massive sandstone	Sm	Ss
Sb	Bedded sandstone	Sb	Fy
Cw	Weakly consolidated conglomerate	Cg	Cw
Mx	Sheared mixed lithologies	Mj Sb SM Ac	Ms?
Ac	Crushed argillite association of rocks	Ac	Ar

2nd Edition		1st Edition	
		North Island	South Island
(iii)	moderately strong to extremely strong sedimentary rocks		
Ar	Argillite	Ar	Ar
Si	Induated sandstone	Sm	Hs
Cg	Conglomerate and breccia	Cg	Cg
Gw	Greywacke association of rocks	Gw	Gw
Li	Limestone	Li	Ls
C	METAMORPHIC ROCKS		
Sx	Semi-schist	-	St1
Sy	Schist	-	St2
Gs	Gneiss	-	Gs
Ma	Marble	-	Ma
D	PERENNIAL ICE AND SNOW		
I		I	I

SOIL

SOIL is a 23 character item giving the soil unit. It's format is:

	s	=	the soil survey character
where	aa...	=	the soil unit
e.g.	BOA'	+	WT'
	*114a	+	25bH
	qToiH	+	NrH + BRock

There is no distinct NZLRI soil classification. The notation and classification used were those defined by the soil survey bulletin and maps referenced by the NZLRI mappers. These soil surveys were the most detailed soil survey available for the area at the time of mapping. The interpretation of the soil unit then, depends upon which soil survey the unit comes from. The soil survey is determined from the first character of SOIL and thence from reference to the index overleaf.

If the soil survey is not one of the general soil surveys for the South or North Island, then the soil unit is left-justified. Where the soil unit is from one of the general soil surveys then it is recorded within the first five character spaces following the survey or '+' notation but is formatted within this space as follows:

	nnngh		
where	nnn	=	right justified soil set number
	g	=	soil subgroup (a - j, or blank)
	h	=	phase character (H or S or blank)
e.g.	20 H		

Normal units have SOIL values derived from their parent surveys', but, may also, or instead, have one or more of the following special values:

BRock	-	Bare Rock
DTail	-	Dredge Tailings
MSoil	-	Mountain Soils (North Island only)
OWork	-	Old Workings (old mining operations)
SKele	-	Skeletal Soils

Non-normal units have the following values:

!estu	-for TYPE = e (estuaries)
!ice	-for TYPE = i (ice)
!lake	-for TYPE = l (lake)
!quar	-for TYPE = q (quarry/mine)
!rive	-for TYPE = r (river)
!town	-for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for SOIL is as follows:

Item name	Item width	Output width	Item type	No. of decimals
SOIL	23	23	c	-

Refer to the DOMSOI item for an expression of the Dominant Soil recorded in the SOIL item. Refer also to the items GENSOI and NZGSOIGRP for two levels of generalisation of the DOMSOI item.

The soil survey characters for the North & South Island soil surveys are referenced below.

North Island Soil Surveys

- * General Survey of the Soils of North island, 1954.
- a Soil survey of Heretaunga Plains, 1939. scale 1:23760
- b Soils of Mid hawkes Bay, 1947. scale 1:95040
- c Provisional soil map of Great Barrier Island, 1952.
- d Soils of Matakaoa County, 1954. scale 1:126720
- e Soils of Gisborne Plains, 1962. scale 1:15840
- f Soil map of Whareama catchment, Wairarapa, 1965. scale 1:126720
- g Soils of the Manawatu-Rangitikei Sand Country, 1967. scale 1:63360
- h Land Inventory Survey — County Series: Ohinemuri Soils, 1968.
scale 1:6336D
- i Land Inventory Survey — County Series: Waimate West Soils, 1970.
scale 1:63360
- j Land Inventory Survey — County Series: Coromandel Thames Soils, 1968. scale
1:126720
- k Soils of Kairanga County, 1972. scale 1:63360
- l Soils of part Wanganui County, 1976. scale 1:31680
- m Soils of part Waitotara County, 1976. scale 1:31680
- n Interim Report on soils of Wellington Region, 1975. scale 1:63360.
- o Interim Report on soils of Wairarapa Valley, 1975. scale 1:126720
- p Soils of Manawatu County, 1977. scale 1:63360
- q Provisional soil map of King Country, 1977. scale 1:63360
- r Soils of Pohangina County, 1977. scale 1:63360
- s Land Inventory Survey — County Series: Wairoa (unpublished).
- t Land Inventory Survey — County Series: Taupo (unpublished).
- u Provisional soil map of Horowhenua County, 1957.
- v Soils of Stratford County, 1978. scale 1:63360
- w Soils of Egmont and part Taranaki Counties, 1981. scale 1:50000
- x Unused.
- y Soils of part Raglan County, 1976. scale 1:63360
- z Soils of Piako County, 1980. scale 1:63360
- A Personal Communication with D.J. Cowie, Southern Hawkes Bay — Wairarapa.
Listing of soils in Soil Conservation Centre Internal Report 64.
- B Provisional soil map of North Auckland, 1947. scale 1 inch : 1 mile
- C Soil map of Whangarei County, 1948.
- D Hauraki Plains, McLeod.
- E Part Franklin County, Orbell.
- F Provisional soil map Awhea and Opouawe Catchments, Gibbs.
- G Soils of Whakatane County (in prep. 1981). scale 1:63360
- H Soils of the Northern part, Kaingaroa State Forest and the Galatea Basin. scale
1:31680
- I Soils of Rerewhakaaitu District, 1978. scale 1:31680
- J Soils of Rotorua lakes District, 1979. scale 1:50000
- K Soils of Northland Region.
- L Special 4-mile soil, pt48b.
- M Soils of Waiotapu Region, 1978. scale 1:31680
- N Soils of Rangitikei County, 1979. scale 1:63360
- O Unnamed soil from 4-mile soil survey.
- P Otaki District Soil Resource Study, Palmer, Wilde.
- Q Manukau City, Pudie et al.
- ! A synthetic value inserted to distinguish non-normal units

South Island Soil Surveys

- * General Survey of the Soils of South Island, 1968.
 - a Soils of Waimea County, 1966. scale 1:126720
 - b Soils of the Inangahua Depression, 1975. scale 1:63360
 - c Soils of the Downs and Plains Canterbury and North Otago, 1967.
scale 1:126720
 - d Soils of Christchurch Region, 1974. scale 1:63360
 - e Soils of Ellesmere County, 1964. scale 1:31680
 - f Soils in the Upper Clutha Valley, 1967. scale 1:31680
 - g Soil map of Ida Valley, Central Otago, 1966. scale 1:31680
 - h Soils of Mid Manuherikia Valley, Central Otago, 1974. scale 1:31680
 - i Soils of Alexandra District, 1964. scale 1:15840
 - j Soils of part Maniototo Plains, Otago, 1966. scale 1:63360
 - k Soils of Roxburgh District, Central Otago, 1972. scale 1:63360
 - l Land Inventory Survey — County Series: Taieri Soils, 1973.
scale 1:63360
 - m Soils of Waikouaiti County, Otago, 1977. scale 1:63360
 - n Soil survey of part Taieri Uplands, 1977. scale 1:63360
 - o Soils of Green Island — Kaitangata District, 1952. scale 1:63360
 - p Soils of the Lower Clutha Plains, 1957. scale 1:31680
 - q Soils of part Paparua County, 1978. scale 1:31680
 - r Soils of part of the Port Hills and Adjacent Plains, 1974. scale 1:31680
 - s Soils of Kowai County, 1964. scale 1:126720
 - t Soils of Waikari District, 1978. scale 1:31680
 - z Soils of Stewart Island, 1974. scale 1:126720
- ! A synthetic value inserted to distinguish non-normal units

SLOPE

SLOPE is a 11 character item giving the average slope class or the two average slope classes of a unit. Its format is as follows:

	sdasd+sdasd		
where	s	=	the slope group (A-G, or blank)
	d	=	the dissaction character (' , or blank)
	a	=	intermediate character (/ . or blank)

The special characters / ' + serve to qualify the slope class recordings. For example

D /E	denotes that average slope is intermediate between D and E
A ^	denotes virtually flat land but dissected by gullies or terrace edges
A +B	denote compound slope, dominantly 'A' but some significant 'B'

The slope classes have the following values:

A	-	0-3 degrees	Flat to gently undulating
B	-	4-7 degrees	Undulating
C	-	8-15 degrees	Rolling
D	-	16-20 degrees	Strongly rolling
E	-	21-25 degrees	Moderately steep
F	-	26-35 degrees	Steep
G	-	>35 degrees	Very steep

Normal units have a SLOPE value

Non-normal units have the following values:

estu	-for TYPE = e (estuaries)
ice	-for TYPE = i (ice)
lake	-for TYPE = l (lake)
quar	-for TYPE = q (quarry/mine)
rive	-for TYPE = r (river)
town	-for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for SLOPE is as follows

Item name	Item width	Output width	Item type	No. of decimals
SLOPE	11	11	c	-

EROSION

EROSION is a 12 character item giving up to 4 significant erosion forms and their severities for each map unit. Its format is as follows:

stststststt

where s = the assessed severity of the following erosion type
 tt = the type of erosion

for example 2sS1eF1Sh
 1G

The first erosion type is the dominant erosion form. Any erosion types which follow are recorded in descending order of prominence.

In the South Island Edition 1 data the first erosion severity record describes the erosion severity for all erosion types in the polygon, not just the type which follows it. Hence, since the first severity position is an assessment for the whole unit the second, third, and fourth severity positions (columns 4, 7, 10 of the EROSION item) are always blank.

The erosion types and their meanings are as follows:

Da	-	Debris avalanche
Ef	-	Earthflow
Es	-	Earth slip
Mf	-	Mudflow
Ss	-	Soil slip
D	-	Deposition
G	-	Gully
R	-	Rill
Sb	-	Streambank
Su	-	Slump
T	-	Tunnel gully
* Sc	-	Scree
* Sh	-	Sheet
* W	-	Wind

Erosion degree or severity is recorded on a 0-5 scale. Sheet wind and scree (asterisked above) are assessed on an areal basis according to the percentage of bare ground or eroding area within the map unit. The severity of the remaining erosion types is assessed on a 'seriousness' basis, taking into account rock type, rate and depth of movement, frequency of erosion events, feasibility and cost of control and economic effect. The erosion severity values and their meanings are as follows:

Severity symbol	Severity expression	Area of land affected (sheet, wind, scree only)
0	negigible	negligible
1	slight	1-10%
2	moderate	11-20%
3	severe	21-40%
4	very severe	41-60%
5	extreme	>60%

For a more detailed description of this classification refer to Eyles 1985.

Normal units have an EROSION value

Non-normal units have the following values:

- estu -for TYPE = e (estuaries)
- ice -for TYPE = i (ice)
- lake -for TYPE = l (lake)
- quar -for TYPE = q (quarry/mine)
- rive -for TYPE = r (river)
- town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for EROSION is as follows:

Item name	Item width	Output width	Item type	No. of decimals
SLOPE	12	12	c	-

EROSION

As a result of a review of inventory classifications at the onset of 1:50 000 scale 2nd Edition mapping the erosion classification had the Erosion Type codes slightly modified. These modifications have been incorporated nationally into EROSION for the sake of consistency.

VEG

VEG is a 20 character item identifying up to 5 significant vegetative cover classes for each map unit. Its format is as follows:

where pgnnpgnnpgnnpgnnpgnn
 p = prefix denoting particular vegetation states (c, C, s, S,
 or blank)
 g = vegetation structural group (H, h, L, l, M, m, N, n, P,
 p)
 nn = number identifying veg class within a group (right
 justified)

for example P 5 p 2 h 1 h 2 m 1
 cN 4 n3a
 P 2 p 3 m11 m19

The first vegetation class is the dominant vegetative cover in the map unit. Any vegetation classes which follow are recorded in descending order of prominence.

A capital letter in the vegetation group recording indicates that the vegetation class comprises greater than 40% of the map unit. A lower case letter indicates less than 40% but greater than 10%. Conventionally, vegetation classes occupying less than 10% of the map unit area were not recorded.

The special prefixes c, C, s, S, were used to identify particular states of the vegetation class which followed. Their meaning is as follows:

C	-	cutover (primarily applied to lowland indigenous forests)
c	-	cutover in patches (applied to lowland indigenous forests)
S	-	stunted (applied to forest classes especially at or near treeline)
s	-	stunted in patches (applied to forest classes especially at or near treeline).

The South Island map sheet notation for VEG differs from both the North Island notation and the computer database. The South Island map sheet system records vegetation GROUPS in descending order of prominence rather than vegetation CLASSES. The South Island system then identifies the significant class numbers adjacent to each other but separated by a comma.

For example:	NI notation	-	P 1 M 1 p 2
	SI notation	-	p 1, 2 M 1

On the computer database the South Island recordings for VEG have been converted to the North Island format as accurately as an office exercise will allow. For enquiries wishing to recover the originally mapped order of SI VEG this is held in the look-up table /lri/info/siveg.lk.

The vegetation groups, broken down into their classes appear overleaf:

For a more detailed description of the vegetative cover classification refer to Hunter and Blaschke 1986.

Normal units have a VEG value

Non-normal units have the following values:

- estu -for TYPE = e (estuaries)
- ice -for TYPE = i (ice)
- lake -for TYPE = l (lake)
- quar -for TYPE = q (quarry/mine)
- rive -for TYPE = r (river)
- town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for VEG is as follows:

Item name	Item width	Output width	Item type	No. of decimals
VEG	20	20	c	-

Prior to the onset of 1:50 000 scale 2nd Edition mapping of the NZLRI the vegetative cover classification and recording notation was considerably developed. While a significant improvement, this 2nd Edition VEG is not immediately compatible with 1st edition VEG. Hence, to maintain a level of national consistency all coverages in the NZLRI have both a VEG and a VEG2 item. Areas covered by 2nd Edition mapping have had their VEG2 recording correlated back to VEG notation so that vegetation information can be accessed in either format from the respective item. The VEG notation, however, remains the only nationally consistent one and so must be used for analyses which include edition 1 areas. Areas covered by edition 1 mapping only have blank records in the VEG2 item.

THE NEW ZEALAND VEGETATIVE COVER CLASSIFICATION (Edition 1)

P		GRASSLAND
	P	Unspecified grassland
	P1	High producing pasture
	P2	Low producing pasture
	P3	Short tussock grassland
	P4	Snow tussock grassland
	P5	Red tussock grassland
	P6	Sand dune vegetation
L		CROPLAND
	L	Unspecified crops
	L1	Cereals
	L2	Orchards and vineyards
	L3	Root and green fodder crops
	L4	Horticultural crops
M		SCRUBLAND
	M	Unspecified scrub
	M1	Manuka, kanuka
	M2	<i>Cassinia</i>
	M3	<i>Dracophyllum</i>
	M4	Fern
	M5	Subalpine scrub
	M6	Mixed native scrub
	M7	Broom
	M8	Gorse
	M9	Blackberry
	M10	Sweet brier
	M11	Matagouri
	M12	Mangroves
	M13	Mountain flax
N		FOREST
	N	Unspecified forest
	N1	Coastal forest
	N2	Kauri forest
	N3	Podocarp-hardwood forest
	N3a	lowland
	N3b	mid altitude
	N4	Beech forest
	N4a	lowland
	N4b	highland

- N5 Hardwood forest
- N6 Exotic forest
- N7 Podocarp forest
- N8 Conservation trees

H

MISCELLANEOUS VEGETATION

natural



- H Unspecified herbaceous vegetation
- H1 Swamp vegetation
- H2 Rushes and sedges
- H3 Sand dune vegetation
- H4 Subalpine and alpine herbaceous vegetatin
- H5 Salt tolerant vegetation
- H6 Pakihi vegetation
- H7 Semi-arid herbaceous vegetation
- Unvegetated land

VEG2

VEG2 is a 20 character item identifying up to 5 significant vegetative cover classes for each map unit. In second edition NZLRI sheets the vegetation classification and notation was considerably modified. The format for VEG2 is as follows:

pgcapgcapgcapgcapgca

- where
- p = prefix denoting particular vegetation states (c, s, e, n, or blank)
 - g = vegetation structural group (g, c, s, f, or h)
 - c = vegetation class within the group.
 - a = percent area of map unit occupied by vegetative class;
 - 0 = 100%
 - 1 = 1-%
 - :
 - 9 = 90%
 - * = class is distributed within previously-named class and whose percent area should be read as the proportion occupied by both classes together.

for example fB0 fK*
 cS4 cK4 gI2
 fB4 sX* fO4 gS2

The first vegetation class is the dominant vegetative cover in the map unit. Any vegetation class which follow are recorded in descending order of prominence.

The vegetation groups, together with their correlations back to the 1st edition classification broken down into their classes appears overleaf.

To maintain a level of national consistency all coverages in the NZLRI have both a VEG and a VEG2 item. Areas covered by 2nd edition mapping have had their VEG2 recording correlated back to VEG notation so that vegetation information can be accessed in either format from the respective item. The VEG notation, however, remains the only nationally consistent one and so must be used for analyses which include edition 1 areas. Areas covered by edition 1 mapping have blank records in the VEG2 item.

Normal units have a VEG2 value.

Non-normal units have the following values:

estu -for TYPE = e (estuaries)
 ice -for TYPE = i (ice)
 lake -for TYPE = l (lake)
 quar -for TYPE = q (quarry/mine)
 rive -for TYPE = r (river)
 town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY AND THOSE AREAS COVERED BY EDITION 1 MAPPING.

The .PAT item definition for VEG2 is as follows:

Item name	Item width	Output width	Item type	No. of decimals
VEG2	20	20	c	-

NZLRI — VEGETATION CLASSIFICATION (Edition 2)

Vegetation class symbol	Vegetation class name	1st Edition Symbol	
GRASS			
gI	Improved pasture		P ₁
gS	Semi-improved pasture	X	P ₂
gU	Unimproved pasture	X	P ₂
gT	Short tussock grassland		P ₃
gW	Snow tussock grassland		P ₄
gR	Red tussock grassland		P ₅
gD	Sand dune vegetation		P ₆
CROPS			
cC	Cereal crops	X	L ₁
cM	Maize	X	L ₁
cP	Pip and stone fruit	X	L ₂
cG	Grapes and berryfruit	X	L ₂
cK	Kiwifruit	X	L ₂
cS	Subtropical fruit	X	L ₂
cR	Root and green fodder crops		L ₃
cV	Vegetables, nurseries		L ₄
SCRUB			
sM	Manuka, kanuka		M ₁
sC	<i>Cassinia</i>		M ₂
sD	<i>Dracophyllum</i>	X	M ₃
sF	Fern		M ₄
sS	Subalpine scrub		M ₅ X M ₁₃
sX	Mixed indigenous scrub	X	M ₆
sT	Mixed indigenous scrub with tree ferns	X	M ₆
sB	Broom		M ₇
sG	Gorse		M ₈
sK	Blackberry		M ₉
sW	Sweet brier		M ₁₀
sA	Matagouri		M ₁₁
sV	Mangroves		M ₁₂
sL	Lupins	X	H ₃
sH	Heath	X	M ₃
sO	Coastal scrub	X	H ₃ X M ₁₃
sE	Exotic scrub		-

Vegetation class symbol	Vegetation class name	1st Edition Symbol
FOREST		
fC	Coastal forest	N ₁
fK	Kauri forest	N ₂
fP	Podocarp forest	N ₇
fB	Broadleaved forest	N ₅
fO	Lowland podocarp-broadleaved forest	N _{3a}
fI	Highland podocarp-broadleaved forest	N _{3b}
fD	Podocarp-broadleaved-beech forest	X N _{3a} N _{4a}
fW	Lowland beech forest	N _{4a}
fG	Highland beech forest	N _{4b}
fU	Beech forest, undifferentiated	N ₄
fF	Exotic conifer forest	X N ₆
fR	Exotic broadleaved forest	X N ₆
HERBACEOUS		
hW	Wetland vegetation	H ₁
hR	Rushes, sedges	H ₂
hA	Alpine and subalpine herbfield/fellfield vegetation	H ₄
hS	Saline vegetation	H ₅
hP	Pakihi vegetation	H ₆
hM	Semi-arid herbaceous vegetation	H ₇
uV	Unvegetated land	-
Prefixes		
c	cutover	c
s	stunted	S
e	erosion control trees	X N ₈
n	naturalised exotic trees	-
r	regenerating	-

X - denotes classes which do not correlate directly with edition 1 classifications.

TYPE

TYPE is a 1 character item giving a category for the map unit.

TYPE may take one of the following values:

e	-	estuary
i	-	icefield
l	-	lake
n	-	'normal'
q	-	quarry or mine
r	-	river
t	-	town or city (urban area)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY.

The .PAT item definition for TYPE is as follows:

Item name	Item width	Output width	Item type	No. of decimals
TYPE	1	1	c	-

AREAH

AREAH is a 12 character floating point item giving the area of the map unit in hectares, to two decimal places.

AREAH is a user-defined and maintained item calculated as:

AREA / 10000 (for NZMG (metric) coverages)
or AREA / 11959.9 (for NZYG (imperial) coverages)

Since AREAH is not maintained by ARC/INFO (as AREA is) then it must be recalculated following any 'overlay' type operation (e.g. clip, intersect, buffer etc.).

All records have a value for AREAH including the world polygon. However, consistent with AREA, the world polygon's AREAH is a negative number.

The .PAT item definition for AREAH is as follows:

Item name	Item width	Output width	Item type	No. of decimals
AREAH	4	12	f	2

LCORR

LCORR is a 5 character item which identifies the North Island Land Use capability correlation unit. Its format is as follows:

	uuuum	
where	u	= NI correlation unit (with the same format as the LUC item)
	m	= modifier

for example 6e21*

The modifier values are:

- * - denotes that the regional (original) LUC unit has been split and there has been separate correlations to other NI correlation units. For example 1c1 in Wairarapa-Southern Hawkes Bay correlates to NI unit 1c1 for 11730 ha but correlates to NI unit 1c2 for the remaining 530 ha.
- + - denotes a moderate correlation only between regional LUC units. For example 44700 ha of 3w1 in Wairarapa-southern Hawkes Bay correlates on a best-fit basis to NI unit 3w6.
- # - denotes a unit that is both a moderate correlation and has been split.

98 NI LUC units have modifiers.

LCORR is the result of an exercise to correlate the units identified in the 10 North Island Regional LUC classifications into a single North Island classification. This reduces the total number of LUC unit entities from 706 to 442.

For more detailed information on LCORR refer to Page 1985.

Normal units have an LCORR value (in the South Island this will simply be a repeat of the dominant LUC unit, since there is only one regional classification).

Non-normal units have the following values:

estu	-for TYPE = e (estuaries)
ice	-for TYPE = i (ice)
lake	-for TYPE = l (lake)
quar	-for TYPE = q (quarry/mine)
rive	-for TYPE = r (river)
town	-for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for LCORR is as follows:

Item name	Item width	Output width	Item type	No. of decimals
LCORR	5	5	c	-

CCAV, CCTO, CCPO

CCAV, CCTO, CCPO are 4 character numeric items giving the Average, Top Farmer, and Potential, stock carrying capacities in Stock Units per Hectare to one decimal place. A Stock Unit is defined as a breeding ewe. There are conversion factors which can be applied to give the equivalent carrying capacity for dairy cows, goats, deer, etc.

CCAV, CCTO and CCPO are derived factors which are indexed to the map unit's dominant LUC.

For more detailed information on these factors refer to Hunter, Lynn & Prickett 1980, and MWD 1981.

Normal units have an CCAV, CCTO or CCPO value.

Non-normal units and those units deemed unsuitable will have a value of 0, this will include THE WORLD POLY

The .PAT item definitions for CCAV, CCTO and CCPO are as follows:

Item name	Item width	Output width	Item type	No. of decimals
CCAV	4	4	n	1
CCTO	4	4	n	1
CCPO	4	4	n	1

PRASIC

PRASIC is a 7 character item giving an assessed class or range of classes for *Pinus radiata* productivity. The format for PRASIC is as follows:

where	p.cc-cc	
	p	= productivity ranking letter (a (highest) - p (lowest))
	cc	= productivity class

for example. b. H-VH

PRASIC may take one of the following values:

a.	VH	Very high
b.	H-VH	High to very high
c.	H	High
d.	M- H	Medium to high
e.	M	Medium
f.	L- M	Low to medium
g.	L	Low
h.	VL- L	Very low to low
i.	VL	Very low
j.	M-VH	Medium to very high
k.	L-VH	Low to very high
l.	L- H	Low to high
m.	VL-VH	Very low to very high
n.	VL- H	Very low to high
o.	VL- M	Very low to medium
p.	US	Unsuitable

These classes are derived from reference to the *P. radiata* site index assessments given in PRSIR and classified according to definitions used by the former New Zealand Forest Service as follows:

0	US	Unsuitable
<20	VL	Very Low
20-24	L	Low
25-29	M	Medium
30-35	H	High
>35	VH	Very High

PRASIC is a derived factor which is indexed to the map unit's dominant LUC.

Normal units have a PRASIC value.

Non-normal units have the following values:

estu -for TYPE = e (estuaries)
 ice -for TYPE = i (ice)
 lake -for TYPE = l (lake)
 quar -for TYPE = q (quarry/mine)
 rive -for TYPE = r (river)
 town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for PRSIC is as follows:

Item name	Item width	Output width	Item type	No. of decimals
PRSIC	7	7	c	-

PRSIR

PRSIR is a 6 character item giving the assessed site index or site index range for *Pinus radiata*. Its format is as follows:

nn-nn
 where nn = an assessed site index for *P. radiata* which may or may not be coupled with a second assessment thereby giving a range.

for example 26
 30-35

Site index is an estimate (or measurement) of the mean height (in metres) of the 100 tallest 20-year-old trees in a sampled hectare. *Pinus radiata* was adopted as the species standard because of its ubiquity in New Zealand and not because it is necessarily the most suitable species for the site.

PRSIR is a derived factor which is indexed to the map unit's dominant LUC.

Normal units have a PRSIR value. 0 is a permitted value but +0 is not. Units with a value of 0 are deemed unsuitable for the purposes of production forestry.

Non-normal units have the following values:

estu -for TYPE = e (estuaries)
 ice -for TYPE = i (ice)
 lake -for TYPE = l (lake)
 quar -for TYPE = q (quarry/mine)
 rive -for TYPE = r (river)
 town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for PRSIR is as follows:

Item name	Item width	Output width	Item type	No. of decimals
PRSIC	7	7	c	-

PRSI^{AV}

PRSI^{AV} is a 2 character integer item giving the average site index for *Pinus radiata* as calculated from PRSI^R.

Site index is an estimate (or measurement) of the mean height (in metres) of the 100 tallest 20-year-old trees in a sampled hectare. *Pinus radiata* was adopted as the species standard because of its ubiquity in New Zealand, and not because it is necessarily the most suitable species for the site.

PRSI^{AV} is a derived factor, calculated from PRSI^R, but ultimately is indexed to the map unit's dominant LUC.

All units have an integer value (usually from 0 - 35)

Particular PRSI^R records were assigned the following PRSI^{AV}:

<15 - 10
 <15-18 - 15
 <15-20 - 15
 <18 - 15

Non normal units and the world poly, together with those units deemed unsuitable all have values of 0.

The .PAT item definition for PRSI^{AV} is as follows:

Item name	Item width	Output width	Item type	No. of decimals
PRSI ^{AV}	2	2	i	-

TOPROCK

TOPROCK is a 3 character item identifying, from reference to ROCK, the principal surface rock type.

The algorithm used to derive TOPROCK simply recognises the first-named, 'entire' (i.e. not patchy) rock type, irrespective of any succeeding stratigraphy.

For example Ar + Gw	TOPROCK = Ar
Al + Lo/Gw	TOPROCK = Al
(Al)/Ss + Cg	TOPROCK = Ss
(Lo) + Al/Ss + Mn	TOPROCK = Al
Lo/Al/In + Ss	TOPROCK = Lo
Cg	TOPROCK = Cg

TOPROCK is a derived factor calculated from and therefore indexed to ROCK. For the classification and nomenclature refer to the section on ROCK.

Normal units have a TOPROCK value as defined above.

Non-normal units have the following values:

est	-for TYPE = e (estuaries)
ice	-for TYPE = i (ice)
lak	-for TYPE = l (lake)
qua	-for TYPE = q (quarry/mine)
riv	-for TYPE = r (river)
tow	-for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for TOPROCK is as follows:

Item name	Item width	Output width	Item type	No. of decimals
TOPROCK	3	3	c	-

BASEROCK

BASEROCK is a 3 character item identifying, from reference to ROCK, the principal underlying rock type.

The algorithm used to derived BASEROCK takes initial note of the qualifying symbols in ROCK, and proceeds as follows:

a) Any 'patchy' rock type and any qualifying symbol associated with a 'patchy' rock (e.g. (Al)/, (Al+Ss)/, (Lo)+, etc.) is ignored.

b) Thence, if ROCK contains a '+' followed by a '/' then BASEROCK is the first-named 'entire' rock type

e.g. Al + Lo/Gw BASEROCK = Al
Al + Wb/Ss + Ms BASEROCK = Al

c) Of the remainder, if ROCK contains a '/' (which is not preceded by '+'), then BASEROCK is the next-named rock type after the last '/'.

e.g. Al/Vo + Ms BASEROCK = Vo
Lo/Al/In + Ss BASEROCK = In

d) The remainder should be where ROCK does not contain a '/', whereupon BASEROCK is the first-named 'entire' rock type,

e.g. Ar + Gw BASEROCK = Ar
Cg BASEROCK = Cg

BASEROCK is a derived factor calculated from, and therefore indexed to ROCK. For the classification and nomenclature refer to the section on ROCK.

Normal units have a BASROCK value as defined above.

Non-normal units have the following values:

est -for TYPE = e (estuaries)
ice -for TYPE = i (ice)
lak -for TYPE = l (lake)
qua -for TYPE = q (quarry/mine)
riv -for TYPE = r (river)
tow -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for BASEROCK is as follows:

Item name	Item width	Output width	Item type	No. of decimals
BASEROCK	3	3	c	-

DOMSOI

DOMSOI is a 9 character item identifying, from reference to SOIL, the dominant (first-named) soil unit. Its format is as follows:

where saaaaaaaa
 s = the soil survey character
 aa... = the soil unit

for example qToiH

DOMSOI is a derived factor calculated from, and therefore indexed to SOIL. For the classification and nomenclature refer to the section on SOIL.

Normal units have a SOIL value defined as the principal (first named) soil and is derived from the SOIL item (and the referenced survey). This soil value may include one of the following special values:

BRock - Bare Rock
 DTail - Dredge Tailings
 MSoil - Mountain Soils (North Island only)
 OWork - Old Workings (old mining operations)
 SKele - Skeletal Soils

Non-normal units have the following values:

!estu -for TYPE = e (estuaries)
 !ice -for TYPE = i (ice)
 !lake -for TYPE = l (lake)
 !quar -for TYPE = q (quarry/mine)
 !rive -for TYPE = r (river)
 !town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for DOMSOI is as follows:

Item name	Item width	Output width	Item type	No. of decimals
DOMSOI	9	9	c	-

GENSOI

GENSOI is a 5 character item identifying, from reference to DOMSOI, the equivalent '4 mile soil' unit according to the classification of the General Survey of Soils NI and SI. Its format is as follows:

	nnngh	
where	nnn =	right justified soil set number
	g =	soil sub-set character (a-j or blank)
	h =	soil phase character (H or S or blank)

for example 64
37bH

GENSOI is a derived factor calculated from DOMSOI, and is therefore ultimately indexed to SOIL. For more detailed description of the classification refer to the relevant soil survey's; New Zealand Soil Bureau 1954, New Zealand Soil Bureau 1968.

Normal units have a GENSOI value as defined above. This value may include one of the following special values:

BRock	-	Bare Rock
DTail	-	Dredge Tailings
MSoil	-	Mountain Soils (North Island only)
OWork	-	Old Workings (old mining operations)
SKele	-	Skeletal Soils

Non-normal units have the following values:

estu	-for TYPE = e (estuaries)
ice	-for TYPE = i (ice)
lake	-for TYPE = l (lake)
quar	-for TYPE = q (quarry/mine)
rive	-for TYPE = r (river)
town	-for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for GENSOI is as follows:

Item name	Item width	Output width	Item type	No. of decimals
GENSOI	5	5	c	-

NZGSOIGRP

NZGSOIGRP is a 10 character left justified item identifying, from reference to DOMSOI, the equivalent 'New Zealand Genetic Soil Group'.

NZGSOIGRP may take one of the following values:

✓	BG	:	Brown-grey earth
	IBGYG	:	Intergrade between brown-grey and yellow-grey earth
	✓ YG	:	Yellow-grey earth
	UYG	:	Upland yellow-grey earth
5	IYGYB	:	Intergrade between yellow-grey and yellow-brown earth
6	IYGBGL	:	Intergrade between yellow-grey earth and brown granular loam
	IYGRE_	:	Intergrade between yellow-grey earth and recent soil
	YBST-	:	Yellow-brown shallow and stony soil
	✓ YB	:	Yellow-brown earth
	IYBBL	:	Intergrade between yellow-brown earth and brown loam
11	IYBGC	:	Intergrade between yellow-brown earth and brown granular clay
	IYBRE	:	Intergrade between yellow-brown earth and recent soil
	YB/BGL	:	Composite yellow-brown earth on brown granular loam
	YB/BGC	:	Composite yellow-brown earth on brown granular clay
	UYB	:	Upland yellow-brown earth
	HCYB	:	High country yellow-brown earth
	ISYBOR	:	Intergrade between subalpine yellow-brown earth and organic soil
13	IAYBOR	:	Intergrade between subantarctic yellow-brown earth and organic soil
	✓ PYB	:	Podzolised yellow-brown earth
	UPYB	:	Upland podzolised yellow-brown earth
	HCPYB	:	High country podzolised yellow-brown earth
22	ISPYBOR	:	Intergrade between subalpine podzolised yellow-brown earth and organic soil
	IAPYBOR	:	Intergrade between subantarctic podzolised yellow-brown earth and organic soil
	POD	:	Podzol
	GPOD	:	Gley podzol
	REND	:	Rendzina
	IRENYG	:	Intergrade between rendzina and yellow-grey earth
	IRENYB	:	Intergrade between rendzina and yellow-brown earth
	IRENRE	:	Intergrade between rendzina and recent soil
	✓ YBS	:	Yellow-brown sand
	PYBS	:	Podzolised yellow-brown sand
	IYBSPOD	:	Intergrade between yellow-brown sand and podzol
	✓ YBP	:	Yellow-brown pumice soil
	YBP/YG	:	Composite yellow-brown pumice soil on yellow-grey earth

YBP/YBS	:	Composite yellow-brown pumice soil on yellow-brown sand
YBP/YBL	:	Composite yellow-brown pumice soil on yellow-brown loam
✓ PYBP	:	Podzolised yellow-brown pumice soil
✓ PYBP/YBL	:	Podzolised composite yellow-brown pumice soil on yellow-brown loam
PYBL	:	Podzolised yellow-brown loam
✓ YBL	:	Yellow-brown loam
IYBLYB	:	Intergrade between yellow-brown loam and yellow-brown earth
IYBLBGL	:	Intergrade between yellow-brown loam and brown granular loam
IYBLRE	:	Intergrade between yellow-brown loam and recent soil
YBL/YB	:	Composite yellow-brown loam on yellow-brown earth
YBL/YBS	:	Composite yellow-brown loam on yellow-brown sand
YB/BGL	:	Composite yellow-brown earth on brown granular loam
✓ RL	:	Red loam
✓ BL	:	Brown loam
✓ BGL	:	Brown granular loam
IBGLYG	:	Intergrade between brown granular loam and yellow-grey earth
IBGLBL	:	Intergrade between brown granular loam and brown loam
BGL/YB	:	Composite brown granular loam on yellow-brown earth
✓ BGC	:	Brown granular clay
PBGC	:	Podzolised brown granular clay
IBGCREN	:	Intergrade between brown granular clay and rendzina
✓ GY	:	Gley soil
IGYYB	:	Intergrade between gley soil and yellow-brown earth
SAGY	:	Subalpine gley soil
✓ OR	:	Organic soil
SAOR	:	Subalpine organic soil
SOL	:	Solonetzic soil
SARE	:	Saline recent soil
✓ RE	:	Recent soil
RE/YBS	:	Composite recent soil on yellow-brown sand
RE/YBP	:	Composite recent soil on yellow-brown pumice soil
R/YP/YBL	:	Composite recent soil on yellow-brown pumice soil on yellow-brown loam
RE/YBL	:	Composite recent soil on yellow-brown loam
REG	:	Regosol
✓ LIT	:	Lithosol
HYT	:	Hydrothermally altered soil
✓ ANT	:	Anthropic soil
✓ SUB	:	Subalpine
✓ ALP	:	Alpine soil
'*'	:	**CLASSIFICATION PENDING**
'!	:	**ALTERNATE SOIL NAME**

NZGSOIGRP is a derived factor calculated from DOMSOI, and is therefore

ultimately indexed to SOIL. The immediate source of the correlation of DOMSOI to NZGSOIGRP was the 'National Soils Database'. For a more detailed description of the New Zealand Genetic Soil Group classification refer to Taylor and Pohlen 1970.

Normal units have a NZGSOIGRP value as described above. This value may include one of the following special values:

- BRock - Bare Rock
- DTail - Dredge Tailings
- MSoil - Mountain Soils (North Island only)
- OWork - Old Workings (old mining operations)
- SKele - Skeletal Soils

Non-normal units have the following values:

- estu -for TYPE = e (estuaries)
- ice -for TYPE = i (ice)
- lake -for TYPE = l (lake)
- quar -for TYPE = q (quarry/mine)
- rive -for TYPE = r (river)
- town -for TYPE = t (town/urban)

NO RECORDS HAVE A VALUE OF ' ' EXCEPT THE WORLD POLY

The .PAT item definition for NZGSOIGRP is as follows:

Item name	Item width	Output width	Item type	No. of decimals
NZGSOIGRP	10	10	c	-

PHAAV, PHATO, PHAPO

PHAAV, PHATO, PHAPO are 2 character integer items giving the phosphate fertilizer requirements to maintain pastoral production at Average, Top Farmer, and Potential stock carrying capacities respectively. The units of measurement are kilograms of phosphate per hectare.

PHAAV, PHATO and PHAPO are factors derived from a somewhat lengthy formula. This formula refers to: 'Soil Group', Dominant Slope, and CCAV (or CCTO or CCPO). Hence it is indexed to a complex of factors derived from LUC, SLOPE and SOIL.

On LUC Class 1 and 2 land with CCPO greater than 25, it was assumed that pastoral management involved the practice of intensive rotational grazing. On all other land the calculation assumed stock management of sheep, beef and deer without the use of intensive rotational grazing.

For more detailed information on these factors including the formula for their derivation refer to Cornforth and Sinclair 1982.

Normal units have a PHAAV, PHATO, or PHAPO value as described above.

Non normal units and those units deemed unsuitable for grazing will have a value of 0, this will include THE WORLD POLY.

The .PAT item definitions for PHAAV, PHATO, PHAPO is as follows"

Item name	Item width	Output width	Item type	No. of decimals
PHAAV	2	2	i	-
PHATO	2	2	i	-
PHAPO	2	2	i	-

PSUAV, PSUTO, PSUPO

PSUAV, PSUTO, PSUPO are 3 character integer items giving the phosphate fertiliser requirements to maintain pastoral production at Average, Top Farmer, and Potential stock carrying capacities respectively. The units of measurement are kilograms of phosphate per stock unit.

PSUAV, PSUTO, PSUPO are factors derived by dividing PHAAV, PHATO, and PHAPO by CCAV, CCTO, and CCPO respectively, i.e. $PSUAV = PHAAV / CCAV$. Hence, PSUAV, PSUTO, and PSUPO in common with PHAAV, PHATO and PHAPO are ultimately indexed to a complex of factors derived from LUC, SLOPE and SOIL.

For a more detailed discussion on phosphate fertiliser requirement, including the formula for the derivation of PHAAV, PHATO and PHAPO, refer to Cornforth and Sinclair 1982.

Normal units have a PSUAV, PSUTO or PSUPO value as described above.

Non normal units and those units deemed unsuitable for grazing will have a value of 0, this will include THE WORLD POLY. However rounding error to derive a single integer value from the calculation will also have given many normal units a zero value so exercise caution when summing on this item. Consideration should therefore be given to making this item 'numeric' with one decimal place.

The .PAT item definitions for PSUAV, PSUTO, PSUPO is as follows:

Item name	Item width	Output width	Item type	No. of decimals
PSUAV	4	4	n	1
PSUTO	4	4	n	1
PSUPO	4	4	n	1

EDITION

EDITION is a 3 character item giving the NZLRI mapping edition for the map unit. It has the following format

where	e.q	=	the NZLRI edition number (currently 1 or 2)
	e	=	
	q	=	a qualifier distinguishing versions within the edition number

for example 2.2

EDITION may have one of the following records:

- 1.1 - First edition mapping undertaken between 1973 and 1979 at a scale of 1:63,360, using first edition classifications.
- 2.1 - Second edition mapping undertaken between 1980 and 1984 at a scale of 1:63,360, using first edition classifications.
- 2.2 - Second edition mapping undertaken since 1985 at a scale of 1:50,000, using second edition classifications.

All map units, including non normal units (except, by definition, the WORLD POLY), have an EDITION.

The WORLD POLY in each coverage has a value of ' '.

The .PAT item definition for EDITION is as follows:

Item name	Item width	Output width	Item type	No. of decimals
EDITION	3	3	c	-

POLYID

POLYID is an 8 character integer item giving a nationally (and temporally) unique identification number for the map unit. It has the following format

where	errnnnnn	=	the NZLRI edition number (currently 1 or 2)
	e	=	the NZLRI survey region (see LEGEND)
	rr	=	unique polygon number for the defined region and edition.
	nnnnn	=	

for example 10204621

All map units, including non normal units (except, by definition, the WORLD POLY), have a POLYID.

The WORLD POLY in each coverage has a value of 0.

The .PAT item definition for POLYID is as follows:

Item name	Item width	Output width	Item type	No. of decimals
POLYID	8	8	i	-

2.2 REFERENCE AND ACKNOWLEDGMENT OF SOURCE

All New Zealand Land Resource Inventory output for distribution should have a reference and acknowledgement of source. Such reference and acknowledgement should include appropriate elements of the following:

- a) Data from: Landcare Research New Zealand Ltd, New Zealand Land Resource Inventory Computer Archive. Landcare Research New Zealand Ltd, Private Bag 11052, Palmerston North.

OR

- b) Data from: NWASCO 1975-79: "New Zealand Land Resource Inventory Survey", 1:63 360. National Water and Soil Conservation Organisation, Wellington, New Zealand.

AND / OR

- : DSIR Land Resources: 1992 : "New Zealand Land Resource Inventory Survey", 1:50 000. Department of Scientific and Industrial Research, Wellington, New Zealand.

OPTIONALLY ACCOMPANIED BY

- c) The NZLRI survey is a multifactor compilation derived from an interpretation of available single factor information, aerial photograph analysis and field work. It shows the distribution of the mapped factors at the time of compilation, within the constraints imposed by classifications and scale. Users deriving or using single factor plots should be familiar with the compilation technique. For more detail refer to NWASCO 1979: Our Land Resources. National Water and Soil Conservation Organisation, Wellington, New Zealand.

3. REFERENCES

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