



## LCDB3 verification

Thanks for agreeing to take part in the LCDB3 verification.

We've mapped a lot of land cover change and corrected a lot of error since beginning this project and now we're hoping that you can strengthen our work with your local knowledge.

## What's changed?

You might be wondering what's changed at LCDB3? Let's look at some of the changes.

### The Future

For the first time the LCDB has a future beyond the current revision – Landcare Research has been contracted for four years to prepare LCDBs 3 and 4 as well as conduct a research programme to improve land cover mapping. MfE are contributing their satellite imagery out to 2012/13. Beyond that, the future becomes uncertain, but there is a will in central government to continue this support.

### The classification

We've cut down the number of land cover classes from 43 to a more manageable 34 (Table 1). Most of this reduction comes from amalgamating the age-class differentiation of exotic forest but there are other amalgamations in the Artificial Surfaces, Cropland and Shrubland groups. The table at the end of this document shows the classifications from LCDB1 to the present. There are other changes we're thinking about, but more on that later...

### The polygons

All the polygons that were in LCDB2 are still there in this draft of LCDB3, except Local Territorial Authorities. LTA and Regional Council boundaries are not intended to be embedded in LCDB at Version 3 – if anyone wants them, they can be burnt in as a post-process. Also some of the really small (< 0.05 ha), mostly error, polygons have been eliminated and we're wondering about the value in other seriously-sub-hectare polygons. We're also contemplating a pre-release 'dissolve' to merge adjoining polygons that have identical attributes after our editing, but more on these thoughts later...

### The boundaries

We've smoothed all the boundary lines to remove irregularities and the stepped lines that originated from earlier raster classification. This has greatly improved legibility at no cost in positional accuracy. In a few places (e.g. south Westland), segments of LCDB were offset from their true position (as depicted by reference imagery and topographic mapping) and these have been 'rubber-sheeted' to their correct position. We're wondering how to handle the coastline, but more on that later...

## LCDB3, our mapping to date...

LCDB3 (nominal date 2008) is a 'catch-up' revision, long overdue and keenly awaited by users. It's been agreed that, for the most part, we'll be rolling over LCDB2 standards and techniques with a

view to release in June-July 2012. There are now columns in the attribute table representing three time steps in LCDB – 1996, 2001 and now 2008.

So, this is not a ‘green-fields’ compilation where every hectare of land has been viewed and systematically mapped. Instead, we have used satellite image classification techniques to detect incompatibilities between 2001 LCDB2 mapping and 2008 satellite imagery. These incompatible areas are filtered and formed into a ‘difference’ layer that directs the attention of our mappers.

Sometimes these differences are spurious and the mapper simply moves on to the next site, but more often they highlight land cover change, or error in LCDB. Sometimes our edits simply require altering the land cover class for a particular year or years. Other times it requires a new boundary to be drawn as well as land cover classes changed.

When we draw in new boundaries we have simply subdivided existing polygons and changed the land cover classes appropriately, we have not (yet) deleted any existing boundaries. This means that there are more boundary lines in LCDB in this compilation – some of these lines have no residual value after our editing and could now be deleted. Other lines are poorly aligned with land cover edges but to fix this alignment by cutting in additional lines would render the map illegible so, for the present, these wayward boundaries must remain until we have the time and resources to re-align them.

## How you can help...

The work to date has been a desktop compilation using the best available satellite imagery, customised mapping tools and trained personnel. It has not, however, had the benefit of field verification nor of intimate local knowledge, which is where, we hope, you can help?

In order of priority, there are probably three ways you can assist:

1. Tell us about known errors in LCDB, and we’ll try and fix them before delivery,
2. Look at our edit sites (over aerial photography, in the field, or other appropriate means) and give us your approval or the edits required, and we’ll fix them before delivery,
3. Look elsewhere in your region and point out problems with LCDB and we’ll try and fix them before delivery

As you do this, please note that:

- LCDB3 has a nominal date of 2008 (let’s say December 2008) – anything that has happened since will have to wait until LCDB4 to be recorded,
- Your comments must be specific and geographically located as described below...

Since the LCDB is a geospatial database we’re giving it to you in digital form as a GIS layer in two formats; as an ESRI File Geodatabase for those using ArcGIS and, as an ESRI Shapefile that should be readable by those using other systems.

The attribute table in these layers has all the original LCDB attributes (unchanged from their former state) but the nine key fields for you to use are:

lcdb1classcode	The current revision LCDB1 (1996) land cover class code. This will be unchanged unless we have found an error and made a corrective edit. <u>Don’t alter values in this field.</u>
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lcdb2classcode	The current revision LCDB2 (2001) land cover class code. This will be unchanged unless we have found an error and made a corrective edit. <u>Don't alter values in this field.</u>
lcdb3classcode	The current revision LCDB3 (2008) land cover class code. This will be the same as lcdb2classcode unless the land cover has changed or we have found an error and made an edit. <u>Don't alter values in this field.</u>
lcr_edited	This is a y/n (yes / no) field to allow you to quickly identify polygons that we have edited
lcdb1classcode_user	This empty field is for you to enter in the true LCDB1 (1996) land cover class code if the current revision code is in error
lcdb2classcode_user	This empty field is for you to enter in the true LCDB2 (2001) land cover class code if the current revision code is in error
lcdb3classcode_user	This empty field is for you to enter in the true LCDB3 (2008) land cover class code if the current revision code is in error
evidence_user	If you have made changes to any of the foregoing three fields please cite the evidence used (even if just to say '2007 aerial photography' or 'field inspection' or something like that)
comment_user	Use this field to make any further comments or add additional information

Of the many ways that you could return comments to us, the following three should allow us time to incorporate your suggestion into LCDB3 before delivery:

1. Our most preferred method is for you to edit your suggestion directly into the layer provided. When editing boundaries, do this as a 'cut' operation (i.e. subdivide existing polygons, don't delete polygons or lines) and populate the '\_user' fields described above with corrected values. Make sure you cite the source of your information in the 'evidence\_user' field. Accumulate all your suggestions into one edited layer before returning it to us.
2. Our next preferred method is for you to have your GIS operator plot affected areas (i.e. errors needing correction) of LCDB superimposed on aerial photography or some other reference layer if possible. Number these plots sequentially and populate an Excel spreadsheet with plot number and (7-figure, 7-figure) NZTM map coordinate of the plot centre (so our mappers can find that location). Either on the plot or in the spreadsheet, or both, mark up and describe the suggested edit(s). Accumulate all your suggestions into one spreadsheet and one folio of plots before returning them to us.
3. Our least preferred method is for you to return just the spreadsheet component of '2' above but, provided the explanation of the suggested edit is clear and unambiguous and, the location accurate, we will do our best to include this edit before delivery.

Please return your completed comments within a couple of months so we can establish a steady workflow editing them into the database.

## Other matters...

To keep up to date with the LCDB project, visit our website at <http://lcdb.scinfo.org.nz>. We will set up a page for "Collaborator checking" and include a Q&A sub-page under that. Nominated contacts

for each collaborating organisation will be enabled to add comments to this page and also the “Issues” page, referred to below...

A technical advisory group is in the process of being formed. Keep an eye on the website to see how you can have input to their work, or feel free to offer your services if you want to get more involved.

Among the things that group will consider are some technical and thematic issues with LCDB, including:

- The ‘bare surfaces’ group of classes doesn’t fill the thematic space available – for example there is no bare rock category available below the alpine environment unless it’s a landslide or along a lake or river. We’re considering the merit if merging ‘Alpine Gravel and Rock’ with ‘River and Lakeshore Gravel and Rock’ into a new generic ‘Gravel and Rock’ class. What do you think?
- The LCDB claims a minimum map unit size of 1 ha. We’ve removed some of the really small polygons but among the 400,000 polygons in the database there still remain 67,000 polygons (17%) smaller than a hectare and 16,000 polygons (4%) smaller than half a hectare. From our observation, the smaller they are the less likely these polygons are to resolve any real difference in land cover so we’re contemplating a further elimination step before release in July. What do you think?
- Our compilation to date has maintained an absolute respect for earlier mapping by not removing any existing boundaries. We’ve just inserted new boundaries along new or corrected land cover edges. As we do this, segments of former polygons have their attributes corrected so they often become described identically to their former neighbours. The old boundaries between neighbouring polygons therefore cease to delineate any real difference between one side and the other so we’re contemplating a pre-release dissolve of these now-spurious boundaries to ‘clean up’ the database. What do you think?
- The coastline of LCDB seems unique to LCDB. It differs from Topo50 which most would consider to be New Zealand’s authoritative coastline and (before our smoothing) it contained segments of stepped linework from early raster classification. We are contemplating delimiting the LCDB with a Topo50 coastline (through an as-yet undetermined process). What do you think?

Please either email us your views on these issues or preferably add comments to the pages under “Issues” on our <http://lcdb.scinfo.org.nz>.

## Contacts

In conclusion, please accept again our grateful thanks for helping make LCDB3 a better product for everyone. If you have any questions about this process, and when it comes time to return your suggested edits, please contact:

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Login to the web site <http://lcdb.scinfo.org.nz> is located at the bottom of each page. However, you will need to have a Google account/password associated with your email address. If you would like us to use an alternate email address that you already have a Google account for, then just email the details

**Table 1: Land Cover classifications of LCDB1 and LCDB2 and LCDB3 (Note, the current LCDB has back-filled LCDB 2 codes and names into LCDB1CLASS and LCDB1)**

Land Cover Group	LCDB 1		LCDB 2		LCDB 3	
	LCDB1ClassCode	Class Name	LCDB2ClassCode	Class Name	LCDB3ClassCode	Class Name
Artificial Surfaces		Urban Area	1	Built-up Area (settlement)	1	Built-up Area (settlement)
		Urban Open Space	2	Urban Parkland/Open Space	2	Urban Parkland/Open Space
		Mines and Dumps	3	Surface Mine	6	Surface Mines and Dumps
			4	Dump	5	Transport Infrastructure
			5	Transport Infrastructure		
Bare or Lightly-vegetated Surfaces		Coastal Sand	10	Coastal Sand and Gravel	10	Coastal Sand and Gravel
		Bare Ground	11	River and Lakeshore Gravel and Rock	11	River and Lakeshore Gravel and Rock
			12	Landslide	12	Landslide
			13	Alpine Gravel and Rock	13	Alpine Gravel and Rock
			14	Permanent Snow and Ice	14	Permanent Snow and Ice
			15	Alpine Grass/Herbfield	15	Alpine Grass/Herbfield
Water Bodies		Inland Water	20	Lake and Pond	20	Lake and Pond
		Coastal Wetland	21	River	21	River
		Inland wetland	22	Estuarine Open Water	22	Estuarine Open Water
Cropland		Primarily Horticulture	30	Short-rotation Cropland	30	Short-rotation Cropland
			31	Vineyard	33	Orchard Vineyard & Other Perennial Crops
			32	Orchard and Other Perennial Crops		
Grassland, Sedgeland and Marshland		Primarily Pastoral	40	High Producing Exotic Grassland	40	High Producing Exotic Grassland
		Tussock Grassland	41	Low Producing Grassland	41	Low Producing Grassland
			43	Tall Tussock Grassland	43	Tall Tussock Grassland
			44	Depleted Grassland	44	Depleted Grassland
			45	Herbaceous Freshwater Vegetation	45	Herbaceous Freshwater Vegetation
			46	Herbaceous Saline Vegetation	46	Herbaceous Saline Vegetation
			47	Flaxland	47	Flaxland
Scrub and Shrubland		Scrub	50	Fernland	50	Fernland
			51	Gorse and/or Broom	51	Gorse and/or Broom
			52	Manuka and/or Kanuka	52	Manuka and/or Kanuka
			53	Matagouri	54	Broadleaved Indigenous Hardwoods
			54	Broadleaved Indigenous Hardwoods	55	Sub Alpine Shrubland
			55	Sub Alpine Shrubland	56	Mixed Exotic Shrubland
			56	Mixed Exotic Shrubland	58	Matagouri or Grey Scrub
			57	Grey Scrub		
Forest		Planted Forest	60	Minor Shelterbelts	71	Exotic Forest
		Major Shelterbelts	61	Major Shelterbelts	64	Forest - Harvested
		Willows and Poplars	62	Afforestation (not imaged)	68	Deciduous Hardwoods
		Indigenous Forest	63	Afforestation (imaged, post LCDB1)	69	Indigenous Forest
			64	Forest - Harvested	70	Mangrove
			65	Pine Forest - Open Canopy		
			66	Pine Forest - Closed Canopy		
			67	Other Exotic Forest		
			68	Deciduous Hardwoods		
			69	Indigenous Forest		
			70	Mangrove		

