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Short webinars for environmental policy-makers and practitioners

A proposal for classifying land-use

The following questions were asked during our live webinar with Richard Law but due to time restrictions, we were unable to answer these in the session.

How can we contact Richard Law? For collaboration?

lawr@landcareresearch.co.nz or our group email classifying_land_use@landcareresearch.co.nz or collaborate in public on this idea at GitHub - We have published a classification "framework" on GitHub at <https://github.com/manaakiwhenua/nzsluc> and at the bottom of that page is a link to one proposed classification "system" at <https://github.com/manaakiwhenua/nzsluc/tree/main/classification-systems/nzlum>. The latter is embedded within the former. In both cases, these are public and open to your comments. Please consider making a GitHub account and making a new "issue" at <https://github.com/manaakiwhenua/nzsluc/issues/>. In this way, your comments can be public, and others can add their voices to your proposals.

Are you able to share the GitHub address?

<https://github.com/manaakiwhenua/nzsluc>

Where can I find the report / info on the land use classification system that Manaaki Whenua has proposed?

Our report is available from MfE: Law, R, Whitehead, B, Cavanagh, J, Ardo, J, Harris, L. 2024. Land Use Information System -- Land Use Classification Framework. Manaaki Whenua – Landcare Research Contract Report LC4488.

How will temporal changes of LULC be acknowledged? In addition, what is the general update schedule for this dataset?

This is not a proposal for a dataset – see below answer. Change over time would be much easier to record with a specific, agreed standard.

How is the data captured? Is it survey desktop work?

We have proposed a standard classification system, not a dataset. This includes a data schema, system of classes with definitions, specifications for metadata standards, etc. However it leaves many unresolved issues. In particular we must emphasise this is not a proposal for a dataset. One, or many, or no people may choose to implement it. The point is that if/when it is implemented, then it is to be done to an agreed standard; with consistent definitions; it will be interoperable with others

over space and time; and tools/models can be developed independently of the land use data that would be an input for those tools/models.

Recognising that land use changes over time, how will this information be kept up to date?

See above answer - We are not proposing data collection. However the classification system can be updated over time, as long as changes are made explicitly, favouring backwards-compatibility, and using semantic versioning.

At what resolution do you expect the land use classification data to be available, and do you anticipate any issues in obtaining high-resolution data on a national scale?

See above answer - The proposed classification system is intended for property parcel-scale or finer. In practice, this is not pre-determined.

The Aus example was at National and State levels, while Northland was down to individual trees - what is the scale that the NZSLUC is aiming for?

Parcel or finer. In practice, this is absolutely limited by the resolution (or geographic unit) of any input information, or (e.g. if using satellite image interpretation) the operator's chosen resolution.

This work looks really good on the structure, but has much work been done on how land use data would be recorded (and by who)? Would it be primarily from aerials and done by Landcare for the whole NZ?

Implementation could be anyone at this stage. A governance group could perhaps assign responsibility for the production of information meeting this specification. Australia's states have a (constitutional) responsibility for land use information; in NZ the closest equivalent is that ratings valuations data must include "actual use" according to the LINZS30300 ratings valuations rules.

Kia ora, what is the end point from this work - for example should councils be using these land use descriptions as definitions in providing for land use activities in reviews of planning documents (i.e. implementing the planning standards?). Will hazard risk information be part of identifying an attribute for land?

There is no "should" at this point. It is a proposal, and lacks any governance. If this is important to you, please consider participating in upcoming discussions about how to progress the idea. Doing this could allow you to propose why and how hazard risk information should be included. Your input would be welcome!

I'm not seeing any information that would be useful for contamination management - land uses associated with persistent pesticides, cadmium accumulation, land known to be contaminated.

This is not a goal of the proposed land use classification system; there will always be competing demands on it. This is why we first established a "framework" under which multiple classification "systems" can be created that meet some minimum standard and have common governance. Alternatively, perhaps there will be consensus that this information is important to include within the remit of the proposed system. In either case, this depends on a future governance model that will include opportunities for you to express your perspective.

Similar to comment made about contaminated land, is there functionality for mapping and categorising natural hazards and risks?

See above answer.

Why do you propose a person's name for data provenance? How will you decide what person that is considering there should be capture, verification, approval, source?

We don't propose a name per se. Rather we propose a "free text" field called "source_data" in the data schema. There is a trade-off between a simple text field that is easy to use and consume, and a detailed, asset-level provenance record. We have proposed the former. Depending on how the data is made, the "source_data" might be a name of a person; but it would be more likely to be the name of a relevant, influential dataset.

Just wondering how privacy is in the way of having a good land use classification that can be useful for policy development. in your framework, is that issue being addressed?

Our proposed framework does not specify any data to use; therefore it does not make any statement at this stage about information privacy. If one were to implement this specification, it is implicit that they would need to consider the license restrictions of any data they use, and the privacy implications of the use and publication of that data.

Tēnā koe Richard, do you foresee models like Te Kahui Raraunga's 'Māori Data Governance' (2022) might be a helpful lens for the work? Are there frameworks already in place for guiding this?

I think the simple response to this question is that any group is free to expand, re-organise or implement this specification in any way they choose. It does not imply any data sharing arrangements between anyone. There is no obligation placed on any group to participate. So it seems to be that issues of data sovereignty are "downstream" issues for those interested in implementing this idea, who may want to consider collaboration with a number of groups that hold sensitive information.

Just a comment - when you begin your Māori engagement work, please feel free to get in touch with our team, Māori Agribusiness at MPI.

Thank you; but note that we have only recommended an engagement to MfE; we hope that this will be conducted. MfE will be the lead on that.

Kia ora Joanne kōrua tahi ko Richard. Awesome quick presentation. What does it look like in terms of consultation with Māori?

Good question. Please ask MfE for the following report: Harcourt, N, Finlay-Smits, S, Harmsworth, G, Awatere, S, Harris, L. 2024. Preliminary findings information synthesis: Māori perspectives about a land use classification framework. Manaaki Whenua – Landcare Research Contract Report LC4444.

How is multiple land uses e.g. primary, secondary uses accounted for? Can you calculate or consider compounding effects?

The proposal is for a primary land use to be recorded in one field; and then others to be listed in one other field. Sorry, I don't understand the question of compounding effects.

How does multi-use of combined solar farms and sheep farming get accounted for?

The primary use is to be recorded on the basis of "the opinion of the land owner or land manager". The secondary use(s) would be captured too, if known.

Regarding urban attributes and zoning, I could not see Mixed Use Zoning? If not, I'd recommend adding this.

Yes, but: my preference would strongly be to record the nature of the mix, i.e. list it as consistent parts in some fashion.

How are you planning to deal with areas that fit into 2 or more categories? For example areas of indigenous vegetation that provide habitat for indigenous fauna, but are also important to local Māori because it's a traditional resource gathering area. Which use class would get priority?

In this particular example, such an "ecosystem service" isn't a direct land use, and thus wouldn't be recorded; the second may not either if it is a traditional resource gathering area but is not actively used for that (and it may not be appropriate to have that in a public dataset). The answer also depends on geographic scale; is the area large enough to be a dominant use on a property scale, or is it a marginal part of a larger property engaged in some other (economic) activity? There is definitely an instrumentalist bias to the proposed classification system; but we are not proposing its adoption in policy. It is one possible view of land use, among many. More generally, to address the question about "mixed use" (which more often comes up in an urban content), the classification system is capable of recording multiple uses, but the primary use "should be assigned on the opinion of the land owner or land manager" (which may be plural). This is an ideal case, since it would not be practical to ask all relevant people for their opinion on the use of their land.

Is it possible to be able to record glasshouses/shade houses that use the soil of the site and those that are growing in artificial media (e.g.. hydroponic operations with concrete floors)?

In the current proposed classification system, this would fall under a "management practice".

You have density classes for residential (low, medium, and high density). What about for commercial land uses, especially office. Would be important for linking land use models with transport models.

There is a strong argument that even in the case of residential property, the density attribute should not be confused with the land use type (residential). Perhaps these are better recorded as "management practices", perhaps it's better to directly record impermeability per unit area, or population density. The same applies to commercial and industrial land, and even agricultural land (stocking rates).

Why is mining included in the 'built environment' section when it is generally considered an activity that occurs in the rural area and generally do not include a larger percentage of buildings?

Because it fits the definition of Class 3, and not the definition of Class 2. All subclasses are nested under the definitions of their parent class. However, for one interested in mining activities, perhaps it is not important either way? The same information would be present, but with a different label (and adjusted definitions of class 2 and 3 to allow the possibility).

There's an aspect of land use (intensity) that is a tactical decision rather than the characteristic of the land itself. e.g. brought in feed in dairy system. can activity be weighted in your framework?

The framework is extendible, by anyone for any reason (as is, really, any classification system). The question may be: can we build a consensus about whether and how to record it in the core specification? Secondly, it comes down to, does that information even exist if we decide whether/how to record it? The second question is important, but not yet what we are in a position to address.

Have we considered separate classifications for native vs exotic carbon forests?

Yes, there is class 1.3.8 and 2.1.5 which address this distinction.

Kia ora Richard, can you please explain the reason for the departure of the plantation forest definition from the commercial forest definition under the NES-CF?

I don't think it makes a departure, as it still distinguishes exotic and indigenous plantation forests. However, we are not experts in forestry and perhaps there is an oversight to be corrected. We have proposed a draft classification and welcome all feedback (see Q1 on page 1).

Where are the boundaries for land, within this system? I'm wondering about the movement into blue carbon in estuarine environments, or riparian ETS "natural vs carbon" farming components.

This is undecided at present.

Does your framework incorporate climate change mitigation and adaptation by aligning land use with biodiversity goals and promoting sustainable agricultural practices?

The classification system does not "promote" anything; it is intended to describe, hopefully in a way that is simple, but still generally useful for a range of uses. It cannot reflect all possible epistemologies. Competing classification systems are welcome (but consistency where possible is ideal); attention is rather paid to how we go about designing these systems, and what standards (e.g. in terms of data quality) are relevant for all of them.

It could be nationally important to have something about carbon storage in here, above and below ground, though that could be added in due course.

Carbon storage seems like a sensible land use; please considering contributing this idea (see Q1 on page 1).

Kia ora Richard. LCDB is the basis for the Threatened Environments classification, which is valuable for prioritising land use and ecological restoration. Will the new LUC be a more accurate basis for classifying Threatened Environments?

This is not a proposal for land cover mapping, and LCDB is independent of this proposal. I imagine better, nationally-consistent land use information would be valuable for this purpose as a complement to LCDB.

Be great to have carbon storage such as mangrove forests mapped.

Identification as "mangrove forest" would be a land cover; but identification of the "use" as carbon storage would be either implied (as a modelling assumption) or otherwise only recorded if that is the actual use as intended by the landowner/land manager. e.g. a mangrove could be a scientific reserve, or part of a recreational area, or marginal land on a farm.

At a high level, the framework seems to stay with a strong Nature / Culture split, which ignores the many practical functions served by indigenous forest, for instance, in favour of biodiversity.

Yes it does. Many "uses" of land are perhaps better addressed as indirect "ecosystem services", which may be benefits or disbenefits of various land covers, uses, and management practices. Land use as a concept generally refers to direct, stated or immediate uses, and has a largely explicit focus on commodities. Is it possible to reconcile both perspectives into one classification system? Or (as we would perhaps propose) having independent classification systems that are subject to similar data validation processes, metadata standards, etc. ("framework" considerations)?

Is this work being done alongside the ecosystem typology also conducted by Manaaki Whenua – Landcare Research? How could the data be integrated?

Not directly. Integration could be the responsibility of end uses as it is ultimately for combining any two independent datasets; or consensus could be built about integrating such information into the classification system itself.

What are the international risks of having land use data being public?

I don't know; however the classification system proposal itself isn't risky, and any published data would obviously need to consider constraints placed on input data used to help perform the classification, including issues of privacy, and maybe biosecurity (from the perspective of hostile actors?).