

# LINKONLINE

Short webinars for environmental policy-makers and practitioners

## A pilot study on unifying terrestrial ecosystem typologies in Aotearoa New Zealand

The following questions were asked during our live webinar with Dr. James McCarthy.

1. A hierarchical classification system has lots of advantages but doesn't always perfectly fit the complexities of real biological systems (see also: Linnaean taxonomy). Are there "problem" ecosystems that don't fit neatly into a hierarchy, and how can these be dealt with?

To date we have limited experience applying the hierarchy to ecosystems, but we do anticipate that challenges will arise. For example, there may be difficulty applying ecotones (which are somewhat analogous to species hybrids in Linnaean taxonomy) to the hierarchy. There were some challenges when allocating existing ecosystems from the expert-based system to the hierarchy, mainly because we didn't always have the information required to make the allocation. Allocating ecosystems to different hierarchical levels using quantitative approaches would be ideal, but this has not yet been done.

2. Does unifying terrestrial ecosystem typologies include rivers and lakes? Looks like wetlands are included but not rivers or lakes.

The terrestrial typology will not include freshwater systems (rivers and lakes) which will have their own typologies.

3. Is the intention to eventually crosswalk to IUCN GET?

That is correct – the goal is that the hierarchical system of the unified typology will include the 'higher' levels from the IUCN GET.

4. Theoretically, how long until we have a single working typology?

At the moment the plan is to have a harmonised catalogue of described ecosystems for Northland, Otago, and terrestrial wetlands by the end of June 2026, with national coverage achieved by June 2027. Extending the typology to capture unsampled ecosystems, and also

producing maps, will follow this and will depend on us maintaining momentum and, importantly, funding to support the work.

## 5. What about geothermal reservoirs? Where do they fit?

Geothermal pools sit within the freshwater biome, so will be out of scope of the terrestrial typology. Geothermal vegetation will be included in the terrestrial typology though, and there are already examples of these types of ecosystem in both typologies.

## 6. Just FYI, a decision was adopted earlier this year under the UN Convention on Biological Diversity (CBD) which defines the operational details of the new global biodiversity monitoring system, adopted to help national and global tracking of progress towards the global targets of the Kunming-Montreal Global Biodiversity Framework (GBF). As part of that decision, all countries were encouraged "to take a consistent approach at the national level to monitoring ecosystems and reporting data across the goals and targets of the Framework, based on national ecosystem classifications", and invited "to make use of the Global Ecosystem Typology, or an equivalent methodology, and cross-reference their national ecosystem data with levels 2 and 3 of that typology, subject to national circumstances and capabilities", *see paragraphs 17-18, Decision 16/31*

<https://www.cbd.int/doc/decisions/cop-16/cop-16-dec-31-en.docx>

Thank you for this comment. Following a review of the IUCN Global Ecosystem Typology, both generally and also by domain leaders in NZ, we have made the same recommendation. The reports for this work are available at:

<https://environment.govt.nz/publications/national-ecosystem-typology/>

## 7. You mentioned the system can be updated. What kinds of events trigger an update to the system?

This is yet to be decided. A pragmatic approach might be to work with versions which are updated every few years, similar to LCDB. In this case, progress to update the typology and the underlying map would continuing between versions. This, however, is just one of many options that could be taken.

## 8. How would your classifications be different from the International Union for Conservation of Nature (IUCN)'s global ecosystem typology?

The system we are proposing would be harmonised with the IUCN GET, but we are working at the finer (more detailed) hierarchical levels (e.g. EcoVeg levels 7 or 8) than those considered in

the IUCN GET (EcoVeg levels 1–3). There are more details on how local (e.g. national) typologies are harmonised to the IUCN GET in the following paper:

Faber-Langendoen D, Keith DA, Loidi J, Helmer EH, Willner W, Navarro G, Hunter J, Liu C, Guuroh RT, Pliscoff P 2025. Advancing the EcoVeg approach as a terrestrial ecosystem typology: From global biomes to local plant communities. *Ecosphere* 16: e70237.

<https://doi.org/10.1002/ecs2.70237>.

## 9. Has the Land Typing expert-based system that maps the underlying natural ecosystems been used to inform your work?

Not at this point. Products like this may come in useful when we are working on mapping ecosystems, but at present all of the work has been focussed on describing the way vegetation communities are described across NZ.

## 10. Will this system ultimately be completed for the whole the country for regional councils and others to utilise – and to allow them to align their current Singers and Rogers mapping with?

Having national coverage is the plan, but it will be contingent on maintaining project funding and momentum.

## 11. You mentioned how emergent technologies will have an impact on making systems like this. Could you speak to that?

There is substantial progress being made on the identification of ecosystems and even individual tree species from remotely sensed imagery and other products like LiDAR. Furthermore, machine learning analytical techniques are becoming the standard for distribution modelling. I expect that the field will continue to develop at pace in response to these emergent technologies, especially with regards to mapping ecosystems.

## 12. There's a third ecosystem/vegetation typology that may be worth considering: the Land Use Capability/NZLRI vegetation descriptions (*see Appendix 3* in: <http://doi.org.landcareresearch.idm.oclc.org/10.7931/DL1MG6>).

They're very basic/high level but they do include modified ecosystems and more importantly, they're extensively mapped at regional and farm scale.

Have you looked at this system?

The NZLRI informed several products, including the Vegetation Cover of New Zealand (by Peter Newsome) which we included in our initial assessments of terrestrial ecosystem typologies in NZ (<https://environment.govt.nz/assets/publications/Road-map-to-update-the-existing-typology-for-terrestrial-ecosystems.pdf>). While it is a useful typology to consider for all the reasons that are stated in the question, and we will keep the LUC/NZLRI in mind for our future work, we found that it is likely to now be out of date and also didn't have the thematic resolution required for the purposes of a revised typology.

**Link to the report supporting the work explained in the seminar:**

<https://environment.govt.nz/publications/national-ecosystem-typology-northland-terrestrial-pilot/>