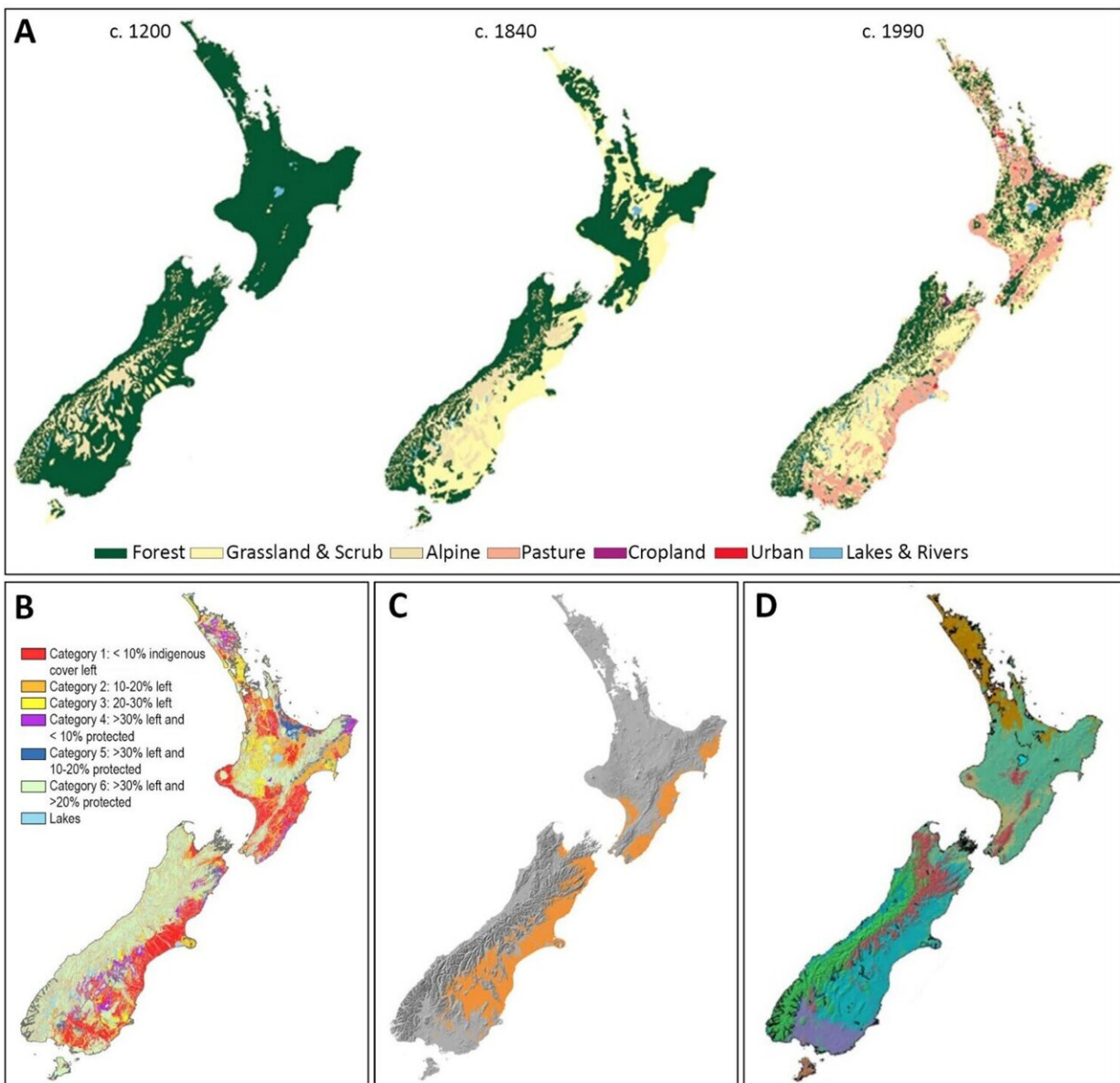


More pragmatic approach needed when sourcing seeds for ecological restoration in New Zealand

May 31 2023



A, left, c. 1200 New Zealand forest cover pre-human settlement; middle, c. 1840 post-Māori burning and pre-European settlement; right, c. 1990 post-European settlement (from Weeks et al. 2012 Weeks ES, Overton JM, Walker S. 2012. Estimating patterns of vulnerability in a changing landscape: a case study of New Zealand's indigenous grasslands. *Environmental Conservation*. 40:84–95. DOI:10.1017/S0376892912000343.[Crossref], [Web of Science], [Google Scholar]). **B**, Threatened Environment Classification (from Cieraad et al. 2015 Cieraad E, Walker S, Price R, Barringer J. 2015. An updated assessment of indigenous cover remaining and legal protection in New Zealand's land environments. *New Zealand Journal of Ecology*. 39:309–315.[Web of Science], [Google Scholar]). **C**, Dryland zone shown in orange (from McGlone et al. 2017 McGlone MS, Richardson SJ, Burge OR, Perry GLW, Wilmshurst JM. 2017. Palynology and the ecology of the New Zealand conifers. *Frontiers in Earth Science*. 5:94. DOI:10.3389/feart.2017.00094.[Crossref], [Web of Science], [Google Scholar]; modified from Walker et al. 2009 Walker S, King N, Monks A, Williams S, Burrows L, Cieraad E, Meurk C, Overton JM, Price R, Smale M. 2009. Secondary woody vegetation patterns in New Zealand's south island dryland zone. *New Zealand Journal of Botany*. 47:367–393. DOI:10.1080/0028825x.2009.9672713.[Taylor & Francis Online], [Web of Science], [Google Scholar]). **D**, Ten environmental domains (from Overton and Leathwick 2001 Overton JM, Leathwick JR. 2001. Measuring environmental distinctiveness. *Science for conservation* 174. Wellington: Department of Conservation. 20 p. [Google Scholar]). Credit: *New Zealand Journal of Botany* (2023). DOI: 10.1080/0028825X.2023.2210289

It's time to relax the strict guidelines around ecosourcing seed for local genetic stock if we want to build resilience into our changing environment.

This call comes from researchers at Manaaki Whenua—Landcare Research and University of Otago who have published research in the *New Zealand Journal of Botany* that suggests creating nine broad

ecosourcing regions.

They believe this will lead to improved restoration outcomes by increasing species and [genetic diversity](#), mitigating the negative effects of inbreeding, and facilitating the genetic rescue of [threatened species](#) populations.

When it comes to [ecological restoration](#) in New Zealand, the sourcing of seeds with a known wild origin and "local genetic stock" has been widely advocated and practiced for the past 50 years. This approach, known as ecosourcing, ensures that the seeds used for restoration come from nearby areas and maintain the genetic integrity of the species.

The concept of ecosourcing was initially introduced by Eric Godley in 1972 to address concerns about planting species outside their natural geographical range, which could disrupt their evolutionary trajectories and lead to unsuccessful restoration outcomes due to poor environmental matches.

"However, we believe that this approach has become overly restrictive," says lead author of the paper, Ecosourcing for resilience in a changing environment, Dr. Peter Heenan.

"Ecosourcing at a strictly local scale limits genetic diversity, confines species to their historical ranges, and reduces conservation options for threatened [species](#)," he says.

For instance, [tree species](#) in New Zealand, which are commonly used in [restoration projects](#), have low genetic differentiation within populations and experience significant gene flow throughout their range. Therefore, the strict ecosourcing of tree seeds provides limited benefits.

Dr. Heenan says it would be more beneficial to use larger ecosources

areas instead of smaller ones, as it would help avoid inbreeding depression and allow for a better match with the local environment.

More information: Peter B. Heenan et al, Ecosourcing for resilience in a changing environment, *New Zealand Journal of Botany* (2023).

[DOI: 10.1080/0028825X.2023.2210289](https://doi.org/10.1080/0028825X.2023.2210289)

Provided by University of Otago

Citation: More pragmatic approach needed when sourcing seeds for ecological restoration in New Zealand (2023, May 31) retrieved 26 June 2024 from

<https://phys.org/news/2023-05-pragmatic-approach-sourcing-seeds-ecological.html>

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