

Regenerative farming likely to increase native biodiversity on New Zealand farms

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Credit: Our Land and Water National Science Challenge

Regenerative farming practices could increase native biodiversity on New Zealand farms, finds a report released today.

It is highly likely that adopting five specific regenerative farming practices will increase native bird abundance and [native vegetation](#), says Professor David Norton of the University of Canterbury.

"It is likely that the condition of native vegetation, native birds and aquatic biodiversity will all improve with a change from conventional to regenerative farming practices," says Professor Norton, "but farmers do need to adapt practices from overseas to ensure they protect Aotearoa's unique environment."

The report is one of three reports released today that outline the possible effects of regenerative farming on [animals](#) big and small, and ways to measure these impacts. The second report outlines how to assess the impact of regenerative farming on the welfare of animals raised for production, while the third examines how invertebrates like spiders and worms can be counted to evaluate the impact of regenerative farming practices.

The three reports were produced by a research project funded by the Our Land and Water National Science Challenge, the NEXT Foundation and Manaaki Whenua—Landcare Research. The project has produced 20 reports being released through November, each providing recommendations for how claims regarding specific possible benefits of regenerative agriculture could be tested in Aotearoa New Zealand.

Native biodiversity conservation on regenerative farms

Regenerative farming was developed in countries with large native mammals, such as bison. To mimic the way these herbivores would have grazed naturally, regenerative farmers overseas practice intense grazing followed by long rest periods.

The New Zealand context is very different: there were no land-based mammals here prior to human settlement, which occurred very late on a global scale. This means much of New Zealand's flora and fauna are not well-adapted to dealing with mammals, and many species are still adjusting to the pressures of settlement. Because of this, 'regenerative' grazing in our native tussock grasslands (and any grazing in native forests) is likely to be detrimental to native biodiversity. The Mackenzie Basin is an area of particular concern.

Despite this key difference, most of New Zealand's pastoral farms are now based on grasses that originated in other countries, such as ryegrass and clover. On these farms, the regenerative grazing approaches followed overseas are appropriate, and build on our well-established rotational grazing practices.

Diverse pasture species are considered a key principle for regenerative agriculture in New Zealand, but researchers warn of risks from additional weed pressure. "There is high potential for some species included in diverse seed mixes to become invasive and cause harm to our native taonga species. Regenerative farmers should take this into account in their planning, and researchers can help identify the potential threats," says Professor Norton.

There are helpful differences in the way a regenerative farmer might think about their land and its management, says Professor Norton. "The underlying philosophy of regenerative farming means that the farm is seen as an integrated system, while more traditional farmers might see conservation and farming as spatially separate parts of the farm," says Professor Norton. "Regenerative farmers might still have core areas for native biodiversity, like forest remnants, but the systems approach encourages these to be connected through the whole farm landscape, and integrated with native habitats beyond the farm."

In the report Native biodiversity and regenerative agriculture in New Zealand, Professor Norton proposes five key practices for implementing biodiversity conservation that could be adopted by people who farm in New Zealand, and which fit with the regenerative farming philosophy:

1. Think about how native biodiversity might be on your farm in future.
2. Clearly identify the factors that are currently limiting or threatening native biodiversity now, and that may do so in future, as you seek to achieve your goals.
3. Take a spatial approach to farm planning that is not constrained by the current farm layout.
4. Implement adaptive biodiversity management at multiple scales across the whole farm.
5. Continually monitor biodiversity outcomes and use this as the basis to refine management.

The report also provides farmers with methods to monitor biodiversity on their property (see Native biodiversity and regenerative agriculture in New Zealand report and appendices, Norton 2021).

Assessing animal welfare on regenerative farms

The possible effect of diverse pastures on the nutrition of grazing animals is one of five domains recommended for assessing animal welfare on regenerative farms, in the report Tracking animal welfare in New Zealand pastoral farms.

"Increasing the diversity of plants in pastures affects animal production, environment and welfare, depending on the function of the plant species," says Lincoln University's Professor Pablo Gregorini, lead author of the report.

Animal welfare is a complicated and emotive subject, says Professor Gregorini, and whether we know it or not, we all value animal welfare. "What animals experience, how they perform and whether they are being treated with respect are important both to them and to us," he says. "Regenerative agriculture is a holistic approach to modern farming that encompasses far more than simply ensuring that enough dry matter and crude protein are available for an animal to consume."

The report recommends five domains for assessing [animal welfare](#) in New Zealand pastoral farms: good nutrition, good environment, good health, appropriate behavior, and opportunities for positive mental experiences. The report outlines how each domain could be measured by farmers and communities, as well as by academic-driven research and through collaboration.

Insects on regenerative farms

Farmers have vastly more 'terrestrial macrofauna'—insects, spiders, worms and millipedes—than any other farm animal. These large invertebrates perform important functions on farm, including pollination, natural pest suppression, improving soil structure and fertility, and increasing plant productivity.

"Resilience in a farm system comes from a wide range of invertebrate species that perform similar functions," says Dr. Melanie Davidson, a research scientist at Plant & Food Research and lead author of the report *Terrestrial macrofauna invertebrates as indicators of agricultural land management practices*. "For example, pollination can be carried out by some fly species in cool overcast weather, and honeybees in warm sunny weather. Diversity of invertebrates provides 'insurance'—so if one species population crashes, other species are present to continue providing an ecosystem service."

Invertebrates are sensitive to environmental disturbances, so they provide valuable evidence of how [farm](#) management practices impact [biodiversity](#) and the wider ecosystem, the focus of this report.

It is not expensive or time-consuming to collect and count large invertebrates, says the report, but it's more challenging to achieve accurate species identification and to create studies that can be repeated for consistent results. The report describes several case studies from New Zealand and overseas that show the advantages and challenges of different approaches.

Provided by Our Land and Water National Science Challenge

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