

RESEARCH ARTICLE

Nature Relatedness, well-being and life satisfaction across an urban–rural gradient

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Abstract

1. There is compelling evidence that both connection to nature itself and engagement with nature-based activities promote positive physical, mental and social well-being outcomes. Most of this evidence comes from studies of urban residents, overlooking the importance—and opportunity—of nature-based interventions for rural communities.
2. We use data from two large-scale surveys totalling 7254 New Zealanders to show that (1) there is a positive relationship between Nature Relatedness (a measure of connection to nature) and well-being and current and anticipated future life satisfaction across the urban–rural gradient; (2) the relationship between Nature Relatedness and well-being/life satisfaction is stronger for urban residents; and (3) Nature Relatedness is associated with well-being and current life satisfaction among both commercial farmers and non-commercial rural residents.
3. Moreover, while people are on average optimistic about their life satisfaction in the future, we find that those with higher Nature Relatedness are disproportionately optimistic.
4. While our findings are correlational, they suggest that promoting a connection to nature may be a viable strategy for enhancing well-being and life satisfaction outcomes regardless of where people live.
5. We discuss the implications of these findings including the importance of considering context of developing of interventions that are suitable for urban and rural communities.

KEYWORDS

Cantril Ladder, nature connectedness, nature-based interventions, outdoor activities, WHO-5

1 | INTRODUCTION

A large body of evidence now shows that both connection to nature and engagement with nature-based activities promote positive physical, mental and social well-being outcomes

(Anders et al., 2023; Capaldi et al., 2014; Dean et al., 2018; Franco et al., 2017; Nisbet et al., 2011; Shanahan et al., 2016). Specifically, exposure and access to natural areas can support outcomes such as reduced stress and anxiety, increased life satisfaction and reduced allergies while promoting behaviours such

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as increased physical activity (Chawla, 2015; Fleming et al., 2016; Hanski et al., 2012; Jackson, 2003; Lawton et al., 2017; Martyn & Brymer, 2016). Higher levels of connection to nature also appear to provide protection against depression, anxiety and poor health outcomes (Anders et al., 2023; Dean et al., 2018) and promote better well-being (Zelenski & Nisbet, 2014). Perhaps as a consequence of this diversity of benefits, exposure to the natural environment has been associated with increased life satisfaction (Biedenweg et al., 2017; Capaldi et al., 2014; Fleming et al., 2016), and nature-based interventions are a useful approach for increasing both life satisfaction and happiness (Pretty & Barton, 2020).

While research has begun to point to nature-based solutions that promote human well-being, it commonly focusses on urban landscapes and communities (e.g. Fleming et al., 2016; Kabisch et al., 2022). Thus, the proposed interventions are urban-centric, emphasising, for example, green prescriptions (Carpenter, 2013; Jepson et al., 2010; Johnson & Wood, 2015; Marselle et al., 2013) and the inclusion of urban green spaces and planting trees along city streets (Chiesura, 2004; de Vries et al., 2013; Duhl & Sanchez, 1999; McDonald et al., 2023). Well-being benefits of the natural environment are rarely studied in rural landscapes. One possible explanation for the dearth of studies in rural areas is an assumption that rural residents have a high baseline 'dose' of nature (Bratman et al., 2015)—for which there is ample evidence in New Zealand (Ministry of Environment, 2022)—and thus may have no additional need for intervention.

Nature can influence individual well-being and life satisfaction through a wide range of pathways (Franco et al., 2017; Shanahan et al., 2019); thus, the benefits people gain from nature are also likely to differ across the rural–urban gradient. Sørensen, 2021 describes a 'rural happiness paradox' in developed countries in which rural residents tend to be happier than urban residents despite the fact that cities are nominally designed to foster human productivity and well-being. A key assumption underpinning this hypothesis is that greater access to nature amenities in rural landscapes leads to higher subjective well-being and life satisfaction. However, *how* a person interacts with the natural environment is likely to add a layer of complexity to these relationships. For example, work-related stress and associated psychosocial demands have been found to negatively impact the extent to which forestry workers gain well-being and mental health benefits from nature (Best et al., 2021). By extension, rural residents who earn their livings from primary industry may have a different relationship with the natural world than rural residents who do not earn their livings in this way, and thus the impact of connectedness to nature may differ for these two rural groups. Indeed, recent research into the relationship between well-being or life satisfaction and rurality has produced contrasting results, with studies finding a range of factors (including work-related factors) influence outcomes (Darghagh Yazd et al., 2020; Jurčičinová et al., 2025). Thus, the influence of a connection to nature on well-being in the context of how a person makes a living warrants further attention.

Individual behaviour and lifestyles may also influence how well-being benefits accrue in rural and urban landscapes. For example,

Attention Restoration Theory posits that nature experiences provide relief from activities that rely on 'directed attention' or focussed concentration on specific activities (Kaplan, 1995), and because urban landscapes have high attentional demand compared to rural landscapes, urbanites may receive greater benefits from natural scenes (White & Shah, 2019). In contrast, Stress Reduction Theory suggests that positive well-being outcomes arise when individuals have access to resources that facilitate survival, thus decreasing physiological arousal (Ulrich et al., 1991). Similarly, the biophilia hypothesis suggests that people have an innate attraction to other life forms that may have a genetic basis (Wilson, 1984). If these theories hold, residents of rural areas should have greater levels of well-being, while those in nature-poor environments (i.e. urban residents) may gain greater benefits from a connection to nature.

Here, we aim to examine how a measure of connection to nature (the short-form Nature Relatedness scale; Nisbet & Zelenski, 2013) relates to well-being and life satisfaction. We also explore whether there is a different association in these relationships across the urban–rural gradient, and whether these patterns differ for rural residents who rely on nature for their livelihoods and lifestyle block owners (the New Zealand term for 'hobby farmers'). While the literature to date supports several competing theories, we posit three hypotheses:

Hypothesis 1. Nature Relatedness is positively associated with both well-being and life satisfaction.

Hypothesis 2. The relationship between Nature Relatedness and well-being and life satisfaction is weaker for rural residents than urban residents.

Hypothesis 3. Within the rural community, Nature Relatedness is more strongly associated with well-being and life satisfaction among lifestyle block owners than farmers, foresters and growers.

We approach our analysis using data from two large-scale surveys of New Zealanders, one restricted to urban residents and a second restricted to rural residents, including both commercial operators and lifestyle block owners. Well-being is measured via the World Health Organisation-Five Well-being Index (hereafter, 'WHO-5'; World Health Organisation, 1998) and life satisfaction is measured via the Cantril Self Anchoring Striving Scale (hereafter, 'Cantril Ladder'; Cantril, 1965). Notably, while most research on well-being and life satisfaction emphasise the 'here and now' (e.g. Patino et al., 2023), optimism is an important indicator of overall well-being (Deaton, 2018; Dzielska et al., 2016; Lee et al., 2023) and has been used to identify groups that may benefit from interventions to boost well-being (e.g. Lee et al., 2023; Zeltzer et al., 2008). The Cantril Ladder measures life satisfaction at present as well as anticipated life satisfaction five years in the future, so we explore how Nature Relatedness influences both current life satisfaction and anticipated future life satisfaction.

2 | METHODS

2.1 | Survey data

Data come from two surveys conducted in 2023. The Survey of Rural Decision Makers (SRDM) is a biennial, Internet-based survey of primary industry in New Zealand first conducted in 2013 (Stahlmann-Brown, 2023). The questionnaire emphasises topics of interest to the primary sector, including ownership structure, land use, managerial focus and environmental and financial performance as well as values, demographics and education. To facilitate testing the hypotheses posited in this paper, the 2023 questionnaire also included two measures of subjective well-being, as well as the short-form Nature Relatedness scale.

The 2023 questionnaire was reviewed by the Manaaki Whenua—Landcare Research Social Ethics Panel (approval number 2223/29) under the guidelines of the Code of Ethics developed by the New Zealand Association of Social Science Researchers. The surveys were fully optional. Informed consent was established on the opening page of the survey. The survey was open from June until August 2023.

A total of 5247 respondents completed the 2023 SRDM. They identify as farmers, foresters, growers (hereafter, 'commercial farmers'), and lifestyle block owners operating in 52 of New Zealand's 53 rural districts and in rural parts of all 13 cities. Two-thirds of these respondents represent commercial operations, meaning that the businesses they operate on their land produce goods and services valued at more than NZD\$60,000 per year. These commercial farmers represent approximately 7% of all commercial farming operations in New Zealand (StatsNZ, 2021).¹ The commercial sample is reflective of the primary sector geographically and demographically (Morgan et al., 2015; Yletyinen et al., 2024), although pastoralist farmers were intentionally over-sampled to address questions of current policy relevance (Stahlmann-Brown, 2023); survey weights were thus applied to the commercial subsample to ensure representativeness by industry and geography.

A second survey for urban New Zealanders was administered online in June and July 2023. The questionnaire included the same measures of well-being and the short-form Nature Relatedness scale, as well as basic demographic and education data. The questionnaire was reviewed by the Manaaki Whenua—Landcare Research Social Ethics Panel (approval number 2223/33) under the guidelines of the Code of Ethics developed by the New Zealand Association of Social Science Researchers. The urban survey was completed by 2007 respondents. The sample was representative in terms of age, gender, location and ethnicity. To be eligible, respondents had to reside in cities or towns with populations exceeding 5000 people. The sampling approach used overlapping quotas to ensure that the sample was represented by gender, age, region and ethnicity.

¹The most recent published numbers on lifestyle blocks date from 2004, so it is difficult to estimate the representation of lifestyle blocks. Based on unpublished data, we estimate that our sample covers 2.5%–3.0% of lifestyle blocks in New Zealand.

2.2 | Well-being

The 2023 SRDM and the concurrent urban survey included two measures of subjective well-being, namely, the WHO-5 inventory of mental well-being and the Cantril Ladder measure of life satisfaction.

The WHO-5 inventory (World Health Organisation, 1998) is a concise, noninvasive means of assessing subjective well-being. It has been validated as a screening tool for mental health problems in clinical settings (Bech et al., 2003) and has been used to evaluate the efficacy of interventions to improve well-being over time (Topp et al., 2015).

The simple inventory consists of five statements:

1. I have felt cheerful and in good spirits
2. I have felt calm and relaxed
3. I have felt active and vigorous
4. I woke up feeling fresh and rested
5. My daily life has been filled with things that interest me

For each statement, respondents record how often they felt that way during the previous 2 weeks, answering on a 0–5 scale, with 0 indicating 'at no time', 1 indicating 'some of the time', 2 indicating 'less than half of the time', 3 indicating 'more than half of the time', 4 indicating 'most of the time' and 5 indicating 'all of the time'. Summing the scores over five statements generates an aggregate score between 0 and 25. Scores of 18 and above indicate high well-being and positive mental health, while scores of 13 and below suggest poor well-being and indicate a higher likelihood of experiencing anxiety, depression and other mental health challenges (Topp et al., 2015).

The Cantril Ladder (Cantril, 1965) is a common tool for measuring subjective well-being. The question is worded as follows: 'Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time? On which step do you think you will stand about five years from now?' The Cantril Ladder is widely interpreted as measuring life satisfaction (Diener et al., 2009), and evidence shows a clear and general tendency for respondents to provide more optimistic views of the next 5 years than the present (Riley et al., 2021). On this scale, respondents may be categorised as 'thriving' (scores of 7+ at present and scores of 8+ 5 years in the future), 'suffering' (scores of 0–4 at present and 5 years in future) or 'struggling' (all other scores) (Gallup, 2016).

2.3 | Nature Relatedness

The Nature Relatedness Scale is a frequently used and tested measurement of connection (or disconnection) from nature (Nisbet et al., 2009). The Nature Relatedness short-form measure (NR-6)—which was

measured in both surveys—provides a truncated version of the full scale and has good internal consistency (Nisbet & Zelenski, 2013). It is considered appropriate where nature connectedness (as opposed to environmental attitudes) is of interest and survey space is constrained.

Respondents indicate their perspective on the following statements using a 0–4 scale in which 0 indicates 'strongly disagree', 1 indicates 'disagree', 2 indicates 'neither agree nor disagree' 3 indicates 'agree' and 4 indicates 'strongly agree':

1. My ideal vacation spot would be a remote wilderness area
2. I always think about how my actions affect the environment
3. My connection to nature and the environment is a part of my spirituality
4. I take notice of wildlife wherever I am
5. My relationship to nature is an important part of who I am
6. I feel very connected to all living things and the earth

The score of each statement is summed per Nisbet and Zelenski (2013). A score of 24 indicates maximal nature connection and a score of 0 indicates minimal nature connection.

2.4 | Covariates

To better identify the relationship between Nature Relatedness and subjective well-being, both surveys also collected demographic data that conceivably influence well-being. For example, men have been shown to report higher subjective well-being than women using some measures, but not the Cantril Ladder (Blanchflower & Bryson, 2023). In high-income, English-speaking countries, the correlation between age and well-being is U-shaped, with a dip in middle age (Steptoe et al., 2015). Ethnic minorities report lower well-being, on average (de Vroome & Hooghe, 2015), while the relationship between education and well-being may be positive (Blanchflower & Oswald, 2004), negative (Clark, 2003) or somewhere in between (Flouri, 2004). Given the focus on agricultural production in the SRDM, that survey also collected other potential covariates of well-being in primary industry, including whether the rural enterprise was adversely affected by extreme weather (Varshney et al., 2023), namely Cyclone Gabrielle and widespread flooding in the months preceding the survey.² Other factors that may impact well-being and life satisfaction among commercial farmers include profitability (Niles & Stahlmann-Brown, 2025; Peel et al., 2015) and industry (Stahlmann-Brown et al., 2024).

2.5 | Model estimation

The WHO-5 inventory scale of mental well-being and the Cantril Ladder measure of life satisfaction are censored at both the lower

end (0 in both cases) and upper end (25 for the WHO-5 score and 10 for the Cantril Ladder measure). We therefore use an interval regression approach (Manski & Tamer, 2002)—a more general form of the common Tobit model—to estimate the relationship between well-being and Nature Relatedness. For our rural sample, we estimate:

$$W_{ijk}^r = \alpha + \text{NR}_{ijk}\beta + \mathbf{X}_{ijk}\gamma + \theta_j + \kappa_k + \varepsilon_{ijk} \quad (1)$$

where W_{ijk}^r is the observed well-being of rural respondent i working in industry j in region k .

We are interested in the parameter β , which measures the effect of Nature Relatedness, **NR**, on well-being. We control for a set of covariates, **X**, and include fixed effects at the industry (θ_j) and region (κ_k) levels to reflect baseline differences in well-being between farmers working in different sectors and in different areas. The normally distributed error term is denoted by ε_{ijk} .

For our urban sample, we estimate:

$$W_{ik}^u = \alpha + \text{NR}_{ik}\beta + \mathbf{X}_{ik}\gamma + \kappa_k + \varepsilon_{ik} \quad (2)$$

where W_{ik}^u is the observed well-being of urban respondent i living in region k .

Equations (1) and (2) are estimated using maximum likelihood techniques, but the resulting estimates are interpreted in the same way as estimates from linear regression (Manski & Tamer, 2002). All regressions are estimated using heteroskedasticity-robust standard errors.

3 | RESULTS

3.1 | Summary statistics

We found that the NR-6 score is lower among urban respondents (mean = 15.0) than among rural respondents (mean = 17.1), a difference that is statistically significant ($p < 0.01$). Within the rural sample, the NR-6 score is statistically higher among lifestyle block owners (mean = 17.6) than commercial farmers (mean = 16.6, $p < 0.01$). The distribution of the NR-6 scores is shown in Figure 1.

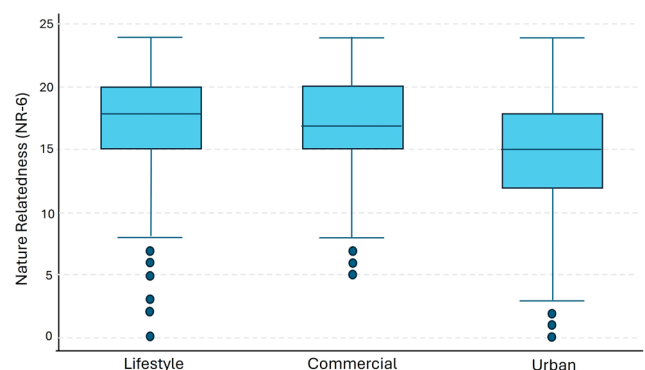


FIGURE 1 Nature Relatedness short-form scale scores from surveys of commercial farmers ($n = 3330$), lifestyle block owners ($n = 1702$), and urban residents ($n = 2007$).

²In economic terms, Cyclone Gabrielle was the most destructive cyclone ever recorded in the Southern hemisphere. It decimated farms on the eastern side of New Zealand's North Island in February 2023.

With a mean WHO-5 score of 12.5, urban residents have lower well-being than both commercial farmers (mean = 14.2, $p < 0.01$) and lifestyle block owners (mean = 14.8, $p < 0.01$). Commercial farmers have lower well-being than lifestyle block owners ($p < 0.05$). With a mean Cantril Ladder score of 6.1, urban residents also have lower current life satisfaction than commercial farmers (mean = 6.9, $p < 0.01$) and lifestyle block owners (mean = 7.0, $p < 0.01$). There is no statistically significant difference in current life satisfaction between commercial farmers and lifestyle block owners. Average anticipated life satisfaction 5 years in future is similar across all groups, with a mean score of 7.3 for urban residents, a mean score of 7.4 for commercial farmers, and a mean score of 7.5 for lifestyle block owners.

Summary statistics for these and other variables included in the empirical analysis are reported in the Supporting Information Table S1.

3.2 | Relationship between Nature Relatedness, well-being and life satisfaction

Table 1 presents estimates of the relationship between Nature Relatedness and well-being, current life satisfaction and anticipated future life satisfaction among commercial farmers (Columns 1, 2 and 3, respectively) and lifestyle block owners (Columns 5, 6 and 7, respectively) as described in Equation 1. In Columns 4 and 8, the relationship between Nature Relatedness and the difference between anticipated future life satisfaction and current life satisfaction (which we interpret as a measure of optimism) is reported for commercial farmers and lifestyle block owners, respectively.

Among commercial farmers, we find that Nature Relatedness is positively correlated with well-being ($p < 0.01$), current life satisfaction ($p < 0.01$) and anticipated future life satisfaction ($p < 0.01$). Among lifestyle block owners, we find that Nature Relatedness is positively correlated with well-being ($p < 0.05$) and current life satisfaction ($p < 0.10$) but not with anticipated future life satisfaction ($p < 0.01$). We also note that Nature Relatedness is correlated with optimism about the future among commercial farmers; that is, the difference between anticipated life satisfaction and current life satisfaction is greater for those with higher Nature Relatedness ($p < 0.05$).

We further find that male commercial farmers report higher well-being and that commercial farmers and lifestyle block owners who were adversely affected by Cyclone Gabrielle reported lower mental well-being and lower current life satisfaction. Profitability is positively correlated with both well-being and life satisfaction among commercial farmers. Finally, commercial dairy farmers report lower well-being than other types of farmers, although they expect greater improvement in life satisfaction in the future than others (together with horticulturalists).

For our urban sample (Table 2), Nature Relatedness is associated with higher well-being ($p < 0.01$, Column 1), higher current life satisfaction ($p < 0.01$, Column 2) and higher anticipated future life satisfaction ($p < 0.01$; Column 3). Nature Relatedness is also associated

with higher optimism about life satisfaction in future ($p < 0.05$, Column 4). We further find that male respondents report higher mental well-being using the WHO-5 inventory and life satisfaction using the Cantril Ladder measure, and that education is positively correlated with well-being.

Table 3 provides a comparison table to show a snapshot of the results.

4 | DISCUSSION

We show that people with higher Nature Relatedness report greater levels of well-being and both current and anticipated future life satisfaction, thus providing compelling evidence for Hypothesis 1. There are three intersecting pathways that could lead to this result. First, our findings could be driven in part by people with higher levels of Nature Relatedness actively seeking out more nature experiences, thereby increasing their 'dose' and realising greater well-being benefits (Shanahan et al., 2016). There is a significant body of evidence that has shown this pattern in urban landscapes in particular (e.g. Cox et al., 2018; Shanahan et al., 2016), and thus we find this scenario highly plausible. Second, the same amount of nature may provide more benefits for those with higher Nature Relatedness than others. Indeed, Anders et al. (2023) found that during the COVID-19 pandemic people who both had greater access to nature and a higher connection to nature also experienced greater well-being and a stronger sense of belonging to natural places. Third, an additional possibility is that people with lower levels of well-being—created through some other mechanism altogether—have lower levels of Nature Relatedness. This could occur, for example, where people dealing with depressive symptoms are less likely to venture outdoors (Cox et al., 2017). Although we find it less likely, it is also possible that lower well-being causally lowers Nature Relatedness, and we cannot rule out this possibility with our current data.

Consistent with Hypothesis 2, the relationship between Nature Relatedness and both well-being and life satisfaction is stronger for urban residents than for rural residents, a finding that suggests that Nature Relatedness may be a more important protective factor for people who live in 'nature-poor' places (Bratman et al., 2015). This relationship is the basis of the widely acknowledged role of green-space in planning healthy, sustainable cities (McDonald et al., 2023) alongside the use of green prescriptions, in which exposure to nature is prescribed by health professionals as a means of increasing well-being (Adewuyi et al., 2023; Swinburn et al., 1998). If interpreted causally, our results further highlight the importance not only of interventions that provide access to nature but also of supporting people's connection to it. There are significant gaps in knowledge on how to achieve this, but there is some evidence for the efficacy of, for example, targeted outdoor education programmes for children (Barrable & Booth, 2020).

Within rural communities, we find that the strength of the association between Nature Relatedness and our measures of well-being and life satisfaction is stronger among commercial farmers

TABLE 1 Relationship between Nature Relatedness, well-being, and life satisfaction among commercial farmers and lifestyle block owners. Interval regression estimates (described in Equation 1) are shown with heteroskedasticity-robust standard errors in parentheses.

Variables	WHO-5 commercial	Ladder now commercial	Ladder future commercial	Ladder difference commercial	WHO-5 lifestyle	Ladder now lifestyle	Ladder future lifestyle	Ladder difference lifestyle
NR-6	0.150*** (0.03)	0.042*** (0.01)	0.072*** (0.01)	0.023** (0.01)	0.093** (0.04)	0.025* (0.01)	0.024 (0.018)	-0.004 (0.013)
Male	0.633*** (0.23)	-0.065 (0.08)	-0.189* (0.1)	-0.109 (0.08)	0.295 (0.27)	-0.164 (0.10)	-0.287** (0.12)	-0.068 (0.1)
Māori ethnicity	-0.311 (0.43)	0.073 (0.15)	-0.155 (0.18)	-0.178 (0.15)	0.480 (0.49)	-0.089 (0.18)	0.355 (0.24)	0.331* (0.19)
Age	0.072 (0.07)	-0.036 (0.02)	0.066** (0.03)	0.096*** (0.02)	0.091 (0.08)	-0.002 (0.03)	0.0526 (0.04)	0.043 (0.028)
Age-squared	0.000 (0.00)	0.001*** (0.00)	-0.000*** (0.00)	-0.001*** (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.001** (0.00)	-0.001*** (0.00)
Education = Cert/ diploma	0.225 (0.32)	0.170 (0.11)	0.206* (0.12)	0.028 (0.1)	0.131 (0.41)	0.048 (0.14)	0.181 (0.17)	0.147 (0.14)
Education = University+	0.508 (0.33)	0.142 (0.12)	0.098 (0.15)	-0.068 (0.11)	-0.161 (0.39)	-0.026 (0.15)	0.014 (0.17)	0.054 (0.15)
Affected by Extreme weather	-1.445*** (0.28)	-0.335*** (0.1)	-0.116 (0.12)	0.233** (0.1)	-0.767** (0.38)	-0.258* (0.15)	-0.113 (0.17)	0.170 (0.14)
Profitability = Break even	1.207*** (0.27)	0.273*** (0.10)	0.049 (0.12)	-0.197** (0.1)				
Profitability = Profitable	2.552*** (0.28)	0.957*** (0.10)	0.742*** (0.13)	-0.239** (0.10)				
Industry = Dairy	-2.030*** (0.29)	-0.614*** (0.100)	-0.278** (0.12)	0.361*** (0.10)				
Industry = Other livestock	-0.593 (0.53)	-0.212 (0.19)	-0.026 (0.22)	0.204 (0.16)				
Industry = Arable	-0.703 (0.73)	-0.266 (0.22)	-0.402 (0.28)	-0.128 (0.24)				
Industry = Horticulture	-0.420 (0.37)	0.015 (0.14)	0.489*** (0.17)	0.410*** (0.13)				
Industry = Forestry	0.468 (0.46)	0.349** (0.16)	0.298 (0.20)	-0.073 (0.15)				
Industry = Grazing, bees, etc.	-0.395 (0.40)	0.053 (0.14)	0.299* (0.18)	0.166 (0.14)				
Constant	5.854*** (2.05)	5.794*** (0.70)	5.182*** (0.82)	-0.573 (0.66)	7.554*** (2.54)	5.680*** (1.01)	6.882*** (1.13)	1.303 (0.83)
Sample size	2778	2802	2798	2798	1478	1497	1493	1493

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

TABLE 2 Relationship between Nature Relatedness, well-being and life satisfaction among urban respondents. Interval regression estimates are shown with heteroskedasticity-robust standard errors in parentheses.

Variables	WHO-5	Ladder now	Ladder future	Ladder difference
	Urban	Urban	Urban	Urban
NR-6	0.239*** (0.03)	0.059*** (0.01)	0.095*** (0.01)	0.024** (0.01)
Male	1.611*** (0.24)	0.351*** (0.09)	0.065 (0.11)	-0.267*** (0.08)
Māori ethnicity	-0.510 (0.37)	0.033 (0.14)	0.120 (0.16)	0.045 (0.14)
Age	-0.167*** (0.04)	-0.012 (0.02)	-0.032* (0.02)	-0.011 (0.02)
Age-squared	0.002*** (0.00)	0.00** (0.00)	-7.69e-05 (0.00)	-0.001*** (0.00)
Education=Certificate or diploma	0.846** (0.33)	0.102 (0.12)	0.33** (0.153)	0.169 (0.12)
Education=University or higher	0.611** (0.28)	0.382*** (0.10)	0.17 (0.12)	-0.176* (0.10)
Constant	8.967*** (1.08)	4.270*** (0.39)	6.987*** (0.46)	2.470*** (0.39)
Sample size	2007	2007	2007	2007

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

TABLE 3 Summary of results comparing the relationship between Nature Relatedness and various well-being and life-satisfaction measures for urban and rural residents.

Measure	Urban	Rural sample	Rural sample
	Sample	Commercial	Lifestyle
Who-5	Significant, $p < 0.01$ Coefficient 0.23	Significant $p < 0.01$ Coefficient 0.15	Significant $p < 0.05$ Coefficient 0.09
Cantril Ladder—current	Significant $p < 0.01$ Coefficient 0.06	Significant $p < 0.01$ Coefficient 0.04	Significant $p < 0.1$ Coefficient 0.03
Cantril Ladder—future	Significant $p < 0.01$ Coefficient 0.10	Significant $p < 0.01$ Coefficient 0.07	Not significant Coefficient 0.02

than lifestyle block owners. This is an interesting finding that runs counter to Hypothesis 3. On reflection, this result could be an extension of the theory that people who live in more nature-poor environments may have more to gain from a connection to nature, and that whether a person has a commercial or non-commercial relationship with it is less important. In New Zealand, there are complex relationships between biodiversity and urban, peri-urban, and rural transitions (Pearson, 2021), but arguably lifestyle blocks can provide varied habitats and less intensive agriculture (e.g. as described by Farmlands, 2021) and could therefore be home to a more diverse suite of biodiversity. As such, people living in these areas may have the highest baseline 'dose' of nature of those sampled here. Lifestyle block residents also had the highest level of Nature Relatedness of the three groups measured in this study. The results show that both lifestyle and location accentuate or attenuate the relationship between Nature Relatedness and well-being/life satisfaction.

While we are unable to unpack the causal direction of the relationship between Nature Relatedness and well-being/life satisfaction in this study, our research reinforces the possibility raised by others that promoting a connection to nature may be a viable strategy to enhance well-being outcomes regardless of where a person

lives. This is becoming increasingly accepted for urban communities, and our results reinforce the notion that this is where nature-based interventions may yield the greatest gains. However, commercial farmers may also have much to gain both from interventions that foster a connection to nature and from improved on-farm biodiversity. Notably, we find significant relationships between extreme weather events and profitability for rural people's well-being and life satisfaction. These results aren't unexpected, with multiple studies highlighting the link between farm outcomes and mental well-being (e.g. Niles & Stahlmann-Brown, 2025; Stahlmann-Brown et al., 2025). Despite the importance of these predictors, Nature Relatedness remained a correlate of positive well-being and life satisfaction, with other factors including age, gender and education showing limited correlations. These latter factors are all well-known predictors of well-being and life satisfaction (e.g. Choi et al., 2023; Jarden et al., 2022; Lee et al., 2022), and as such, our results are surprising. Conceivably, a connection to nature may support a level of resilience when people are faced with other challenges, suggesting that fostering a connection to nature could be a relatively powerful way of supporting rural residents' resilience. This sits alongside other lifestyle and contextual factors that influence people's well-being (Jurčišinová et al., 2025; Zou Bakkeli, 2023), highlighting the

need to consider nuance in context and other factors when considering potential interventions.

Our results show that higher Nature Relatedness is predictive of disproportionately higher anticipated life satisfaction, at least for urban people and commercial farmers. The extent to which a person holds favourable expectancies for their future (by some definitions, 'optimism') is important for understanding their vulnerability to mental disorders and is commonly considered a protective factor with regard to well-being and physical health as well as improved coping strategies (Chang & Sanna, 2001; Conversano et al., 2010; Della Vista et al., 2010; Scheier & Carver, 1985). This is a novel finding. Perhaps linked to a potential optimism pathway to well-being outcomes, paradoxically, Dean et al. (2018) found Nature Relatedness and a conservation worldview were related to *increased* symptoms of depression, anxiety or stress. This was theorised to have been caused by the degradation of natural environments having a stronger effect on and perhaps creating a more pessimistic outlook for people who value these landscapes more highly. Dean et al. (2018) used the full 21-point scale to measure Nature Relatedness (Nisbet et al., 2009), and further research across the urban–rural gradient that uses this broader measure than the short form used in our study may provide further insights into these patterns.

While the positive relationship between Nature Relatedness and well-being/life satisfaction holds on both ends of the urban–rural gradient, the healthcare context of rural communities is distinct from that of urban areas, and thus, the interventions that work for city dwellers may or may not succeed in the rural context (Gessert et al., 2015; Younker & Radunovich, 2021). Parallel fields of research may provide insights into how such interventions could be designed. For example, Pelletier et al. (2022) found that exercise prescriptions can be successful strategies for people living in rural landscapes, but their success was predicated on follow-up reminders and tracking progress. This same approach may support the implementation of green prescriptions in rural communities. Another element to consider is whether reversing environmental degradation on farms could support better well-being and life satisfaction outcomes among primary producers. For such individuals, improving the farm environmental outcomes may also improve the well-being of the farmer, particularly where they already hold a strong connection to nature.

We note that this research has implications for sustainability initiatives and points to the intrinsic value in healthy natural places demonstrated in other work (Ambrey, 2014). In New Zealand, there is a growing impetus to support integrating biodiversity considerations into commercial endeavours under the broad recognition that averting the dual crises facing the climate and biodiversity cannot be addressed by governments alone. This approach may not only benefit biodiversity but also the people involved in this work. These benefits represent an important consideration worthy of attention from both the conservation and well-being sectors.

AUTHOR CONTRIBUTIONS

Danielle Shanahan and Pike Stahlmann-Brown conceived the ideas and designed the methodology; Pike Stahlmann-Brown collected

and analysed the data; Danielle Shanahan and Pike Stahlmann-Brown led the writing of the manuscript. Both authors contributed critically to the drafts and gave final approval for publication.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The anonymised data used in this study may be made available upon written request from the authors. Requests will be reviewed on a case-by-case basis by Manaaki Whenua—Landcare Research's social ethics review panel.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Data S1. 2023 Survey of Rural Decision Makers.

Table S1. Summary statistics showing mean values and standard deviations for variables measured in a survey of urban and rural residents.

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