Research Report
Urban Greenspace

people+cities+nature

restoring indigenous nature in urban environments

The benefits of natural spaces

Yolanda van Heezik, Claire Freeman, Audrey Heyzer, Yvette Buttery

Background

Exposure to nature and natural spaces in cities is strongly linked to mental, physical and spiritual well-being (Ward Thompson et al. 2011; van Dillen et al. 2012). City dwellers who are disconnected from nature are not only less likely to experience the therapeutic and restorative benefits provided by nature exposure, but they can be less motivated to support biodiversity initiatives at an individual and political level.

Urban green and blue spaces are areas where people can enjoy the benefits nature has to offer, but there is still much to be learnt about the features of green spaces that influence their use, and the values that people attach to different spaces and species in their urban environment. New Zealand's population is also becoming increasingly diverse, so it is important to understand how perceptions of nature and values might vary across different population groups. Natural spaces are also vital in supporting urban native biodiversity. Can the same features that make green spaces attractive to people also serve the needs of other species?

It is well-known that connected networks of large fragments of native habitat provide the best conditions for biodiversity in urban areas, but the reality is that these optimal configurations are rare, and the largest gains will be made by optimising the connection, composition and structure of many small-scale neighbourhood green spaces, such as private gardens (Ikin et al. 2013). Cumulatively, private gardens comprise the largest green space across most urban areas. We also need to know more about how householders can be motivated to support biodiversity in their gardens.

Dunedin North East Valley Lindsay Creek event

Research aims

The People, Cities & Nature Greenspace Benefits study aimed to develop a better understanding of what motivates a diverse range of New Zealanders to use local green and blue spaces, value landscapes and species in their own environments, and support and engage in biodiversity management.

To this end we conducted four related studies. Each is discussed with reference to its specific research question, methods and findings. Although our research focus was originally intended to be on green space benefits, a range of natural space types were identified by study participants, including blue and green spaces, and reflecting the coastal nature of the cities sampled. For this reason, we refer to them collectively as 'natural spaces'.

Our research aims for each project are as follows:

1

Ethnic groups

- Identifying factors (e.g., ethnicity, age, socio-economic status) influencing the extent of use of urban natural spaces
- Identifying features of natural spaces, and landscape types that are valued, in relation to their biodiversity value
- Identifying species that are both familiar to and valued by diverse groups

2

Families

- Which open spaces do multi-generational families use and why?
- Identifying preference for native species and more natural spaces over formally landscaped spaces.
- Evidence of family place attachment to natural spaces, and demographic variability by life phase.

3

Young Adults

- What are the attitudes of young adults towards biodiversity conservation and management?
- What are the attitudes of young adults towards engagement in pro-environmental behaviours and local and regional planning initiatives?

4

Barriers & Drivers

- What are the barriers to and drivers of biodiversity management by householders in private gardens?

1

Ethnic groups

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Researchers: Audrey Heyzer, Roa Crease, Claire Freeman, Yolanda van Heezik

Methods

The primary method was a survey aimed at a diverse sample of adults in Auckland, Wellington and Dunedin. This survey was a one-on-one interview (157 females, 73 males) focused on determining urban residents' use of public and private green and blue spaces in terms of time spent in these spaces over the long term, reasons for visits, activities carried out and perceived qualities of the spaces visited. We also recorded landscape preferences, and familiarity of common urban plant and animal species. We measured nature connection and included a number of questions gauging attitudes towards urban green space. Socio-demographic data included gender, age, socio-economic status, level of education, and also how long the participant had lived in New Zealand. We also measured childhood nature experiences.

Findings

Research Question 1:What are the factors influencing the extent of use of urban natural (green and blue) spaces

In this part of the study we aimed to address several questions on natural space use, preferred attributes of natural spaces, and preferences in relation to biodiversity of those spaces. We refer to natural spaces (rather than green spaces) because in the cities sampled, many of the spaces selected by participants were coastal. Very few participants in our study (n = 20, 8.7%) did not visit natural spaces at all, and five of these stated they preferred their own gardens, so they could still benefit from nature contact.

Figure 1. Mean scores of time spent in public natural spaces for participants in each city, with 95% confidence intervals

Are there common characteristics of people that lead to them spending more time in natural spaces? We found that income status, gender and level of education had no effect on the amount of time people spent in public natural spaces. Study participants in Auckland tended to spend less time in natural spaces than those in the other cities (Fig. 1).

Besides the city where people lived, the only other factor that had an effect on the time people spent in natural spaces was their degree of nature connection, which was measured using the Nature Relatedness (NR) Scale (Nisbet et al. 2009). Nature connection is an individual's subjective sense of their relationship with nature, encompassing cognitive, affective and experiential dimensions (Nisbet et al., 2009). Frequent and direct exposure to nature has been proposed to enhance nature connection in individuals.
Nature connection had a small and positive effect, in that people with higher NR scores tended to spend more time in natural spaces. The same effect was found for landscape preferences as well (see below). However, the association with nature connection was always weak, reflecting high variation between people. There was also a very weak association with age, in that fewer people over the age of about 65 years reported very low time spent in natural spaces.

Do people that spend more time in nature as a child spend more time in public natural spaces as an adult? Nature exposure during childhood is thought to foster habits and preferences leading to greater nature exposure in adult life, thus providing an indirect route to increased mental and physical well-being, and greater engagement in pro-environmental behaviours. We explored the relationships between childhood nature experience (CNE) and time spent in nature, landscape preferences, biodiversity exposure, nature connection and willingness to engage in pro-environmental behaviours as adults. We didn't find any association between CNE and time spent by adults in public and private green and blue spaces, and those with higher CNE scores did not select more biodiverse spaces to visit as adults. We also tested the effect of family values regarding nature and the outdoors, as experienced by participants during their childhoods, but found a similar lack of any association with time spent in open spaces and preferences for landscapes.

Childhood nature experience and engagement in pro-environmental behaviours by young adults: Among young adults there was a weak association between childhood nature experience, and family values during childhood, and willingness to engage in pro-environmental behaviours. There was also a weak positive association with study participants' awareness of the term biodiversity and strategies to improve biodiversity, the degree to which they valued biodiversity and urban green spaces, and their belief in the wellbeing benefits of nature for people.

These results suggest that even where there is a deficit of childhood experiences adults can positively engage with nature in green and blue spaces if these spaces are readily accessible and of sufficient quality. It is possible that nature experienced as an adult is more important in influencing behaviours that bring people into contact with nature than childhood nature experiences. These findings emphasise the importance of available and high-quality natural spaces for all life stages.

Are people who spend more time in natural spaces exposed to greater biodiversity? The role of actual biodiversity found in green spaces is mostly unknown. Recent research suggests that biodiverse green spaces may host a high diversity of environmental microbiota which positively affect human health through their impact on the immune system (Aerts et al. 2018). We were able to discriminate between the natural spaces that people visited in terms of the biodiversity that visitors were likely exposed to, by applying a bioscore to these sites following the methodology of Hand et al. (2016). This score integrates information on perceived species richness of habitats and features within habitats, as well as naturalness and wildness.

Study participants who spent more time in natural spaces were exposed to greater biodiversity (Fig. 2). The variation in biodiversity exposure evident among people with a higher score of time spent in public natural spaces reflects the variation in biodiversity among those spaces. The significance of greater exposure and the mechanisms by which biodiversity influences human health are currently being investigated in many international studies.

Are the kinds of attributes people like about green and blue spaces also conducive to supporting biodiversity? To answer this question, we needed to know more about the reasons for visiting public natural spaces, the attributes of the natural spaces that people like, and the biodiversity value of the spaces preferred by people. Are the preferred attributes also features that support biodiversity? Figure 3 shows the reasons given by the different ethnic groups for visiting natural spaces. What is evident is that while there are a lot of different reasons, the three most important ones across all ethnicities were exercise, enjoying nature and relaxing.

Figure 4 shows the attributes of the natural spaces that study participants appreciated. Most study participants valued the spaces they visited for their lushness, spaciousness and serenity, and less so for the impression of wildness, and for heritage values. Both lushness and space can be positive for biodiversity – large areas that support a lot of vegetation are also likely to support a lot of invertebrates, and the species that feed on them.

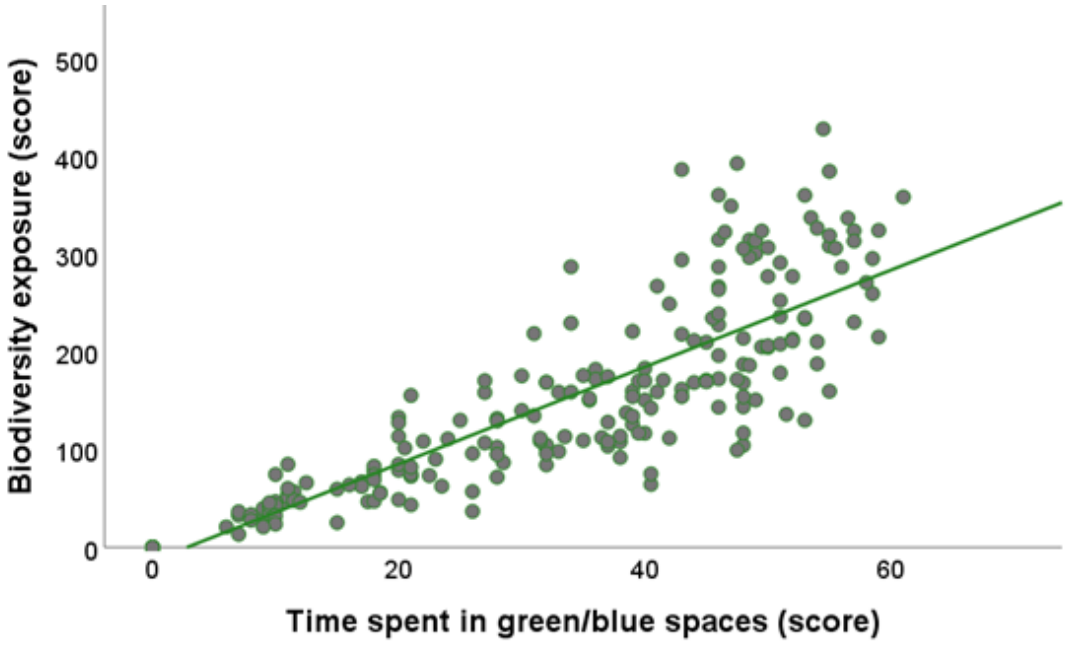

Figure 2. Time spent in natural spaces in relation to biodiversity exposure for 219 study participants in Auckland, Wellington and Dunedin

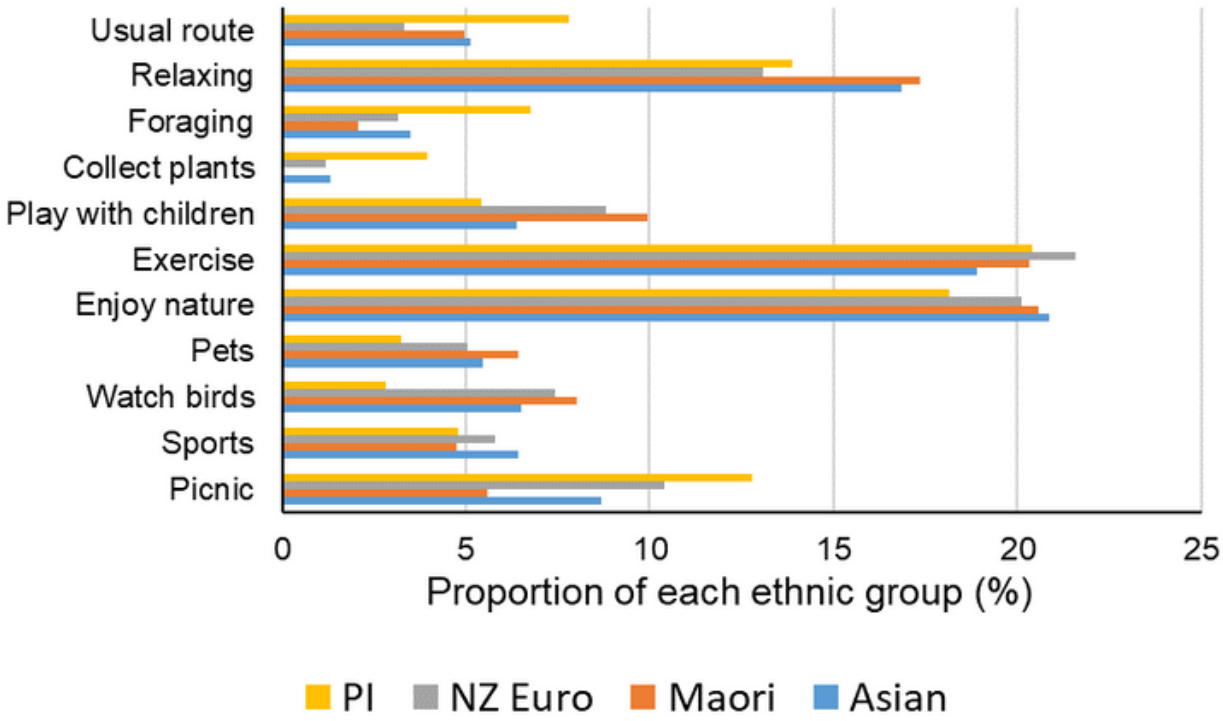

Figure 3. Reasons for visiting public natural spaces by different ethnic groups of New Zealanders (PI = Pacific Islander; NZEuro= New Zealand European)

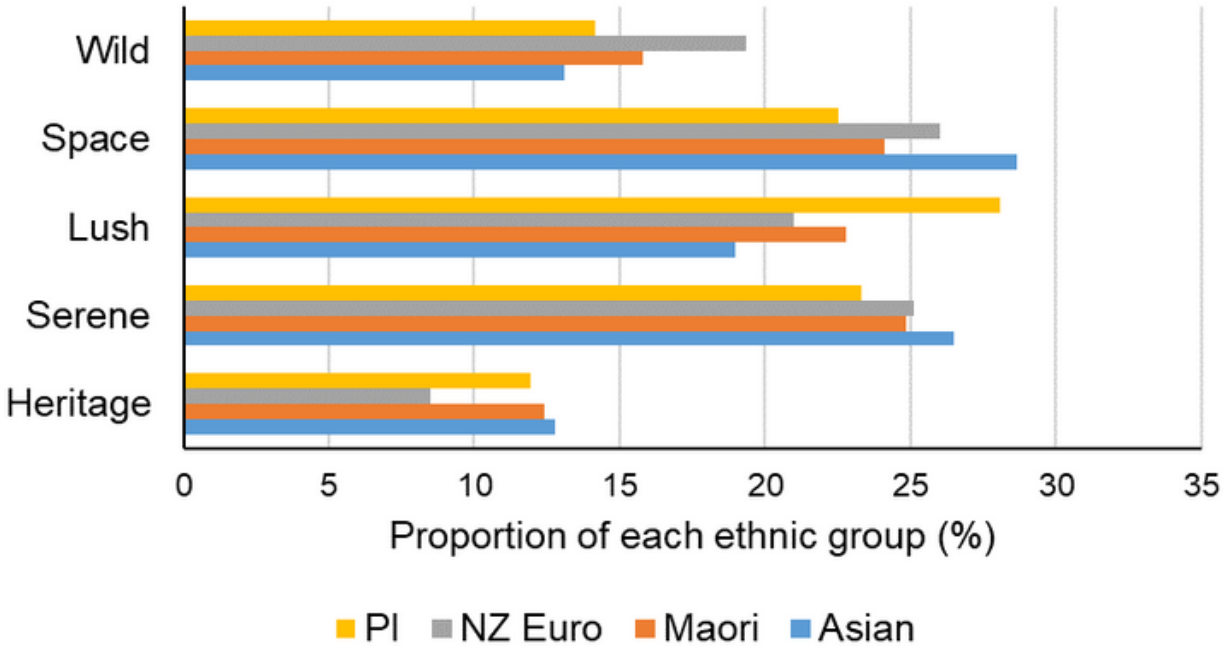

Figure 4. Attributes of public natural spaces identified by different ethnic groups as important (PI = Pacific Islander; NZEuro = New Zealand European)

Research Question 2: What are the features of natural (green and blue) spaces, as well as landscape types, that are valued, in relation to their biodiversity value

In terms of landscape preferences, do people like biodiverse spaces? The answer to this question is YES. Data were collected from 214 participants across three cities. A landscape preference score was calculated based on people's preferences across a spectrum of images ranging from highly manicured and poorly vegetated, to densely vegetated and less manicured, for five landscape types: the score was the average of the preferred options for all five landscape types (Fig. 5).

Below are examples of the information collected for two of the urban land cover types: residential streets and open public areas (Figs 6 & 7). Most people preferred well-vegetated streets with grassy berms/verges and many trees, but this preference was strongest among Māori and NZ Europeans.

The average landscape score was 3.12 out of a maximum 4 (SD = 0.55), indicating that in general, people like well-vegetated biodiverse landscapes. The Asian ethnic group (Chinese and Indian combined) had the lowest average Landscape Score and NZ Europeans and Māori had the highest (Fig. 8), but there was a lot of variation within each group.

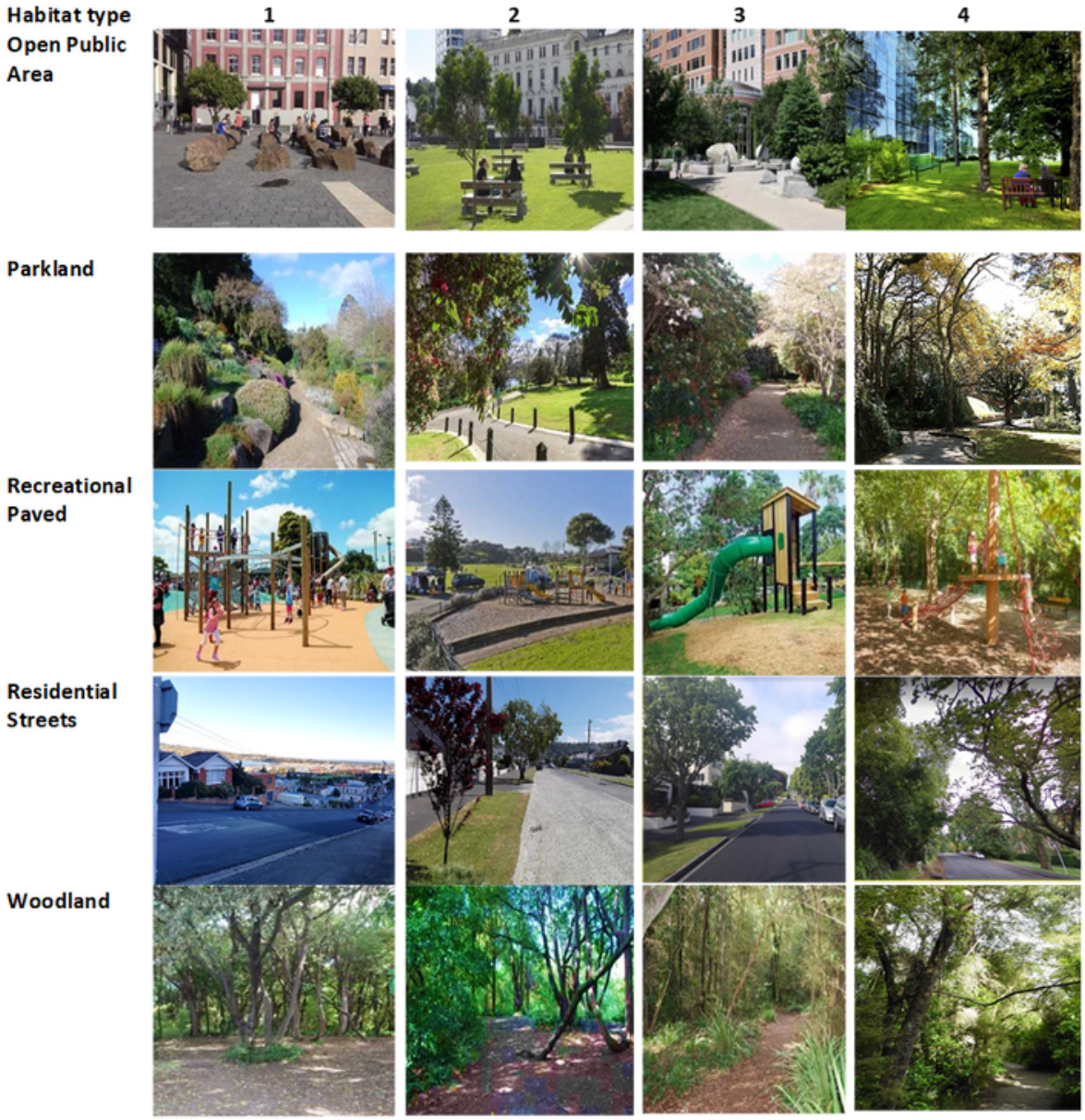

Figure 5. A spectrum of images for five land cover types, from less vegetated and more manicured on the left, to more vegetated and less manicured on the right

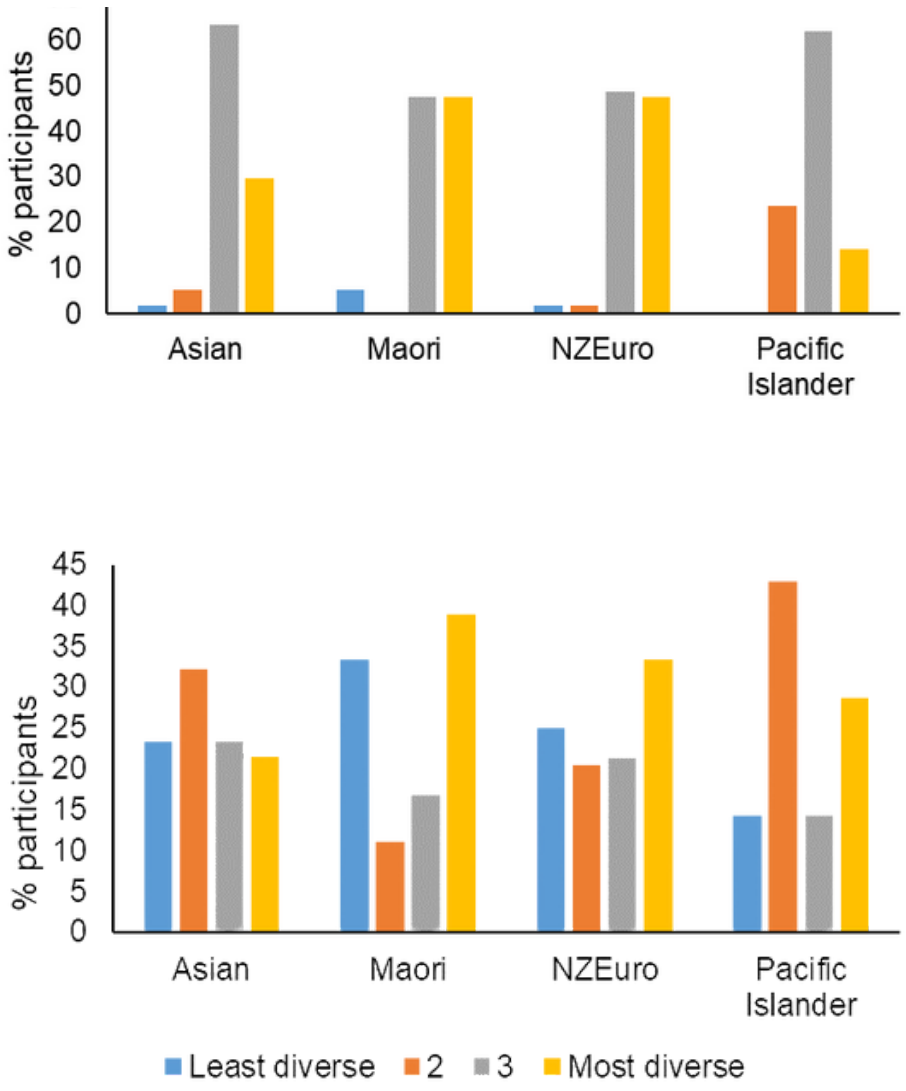

Figure 6. Preferences (proportions) of participants of differing ethnicities for four different residential street scenes (top) and public open spaces (bottom).

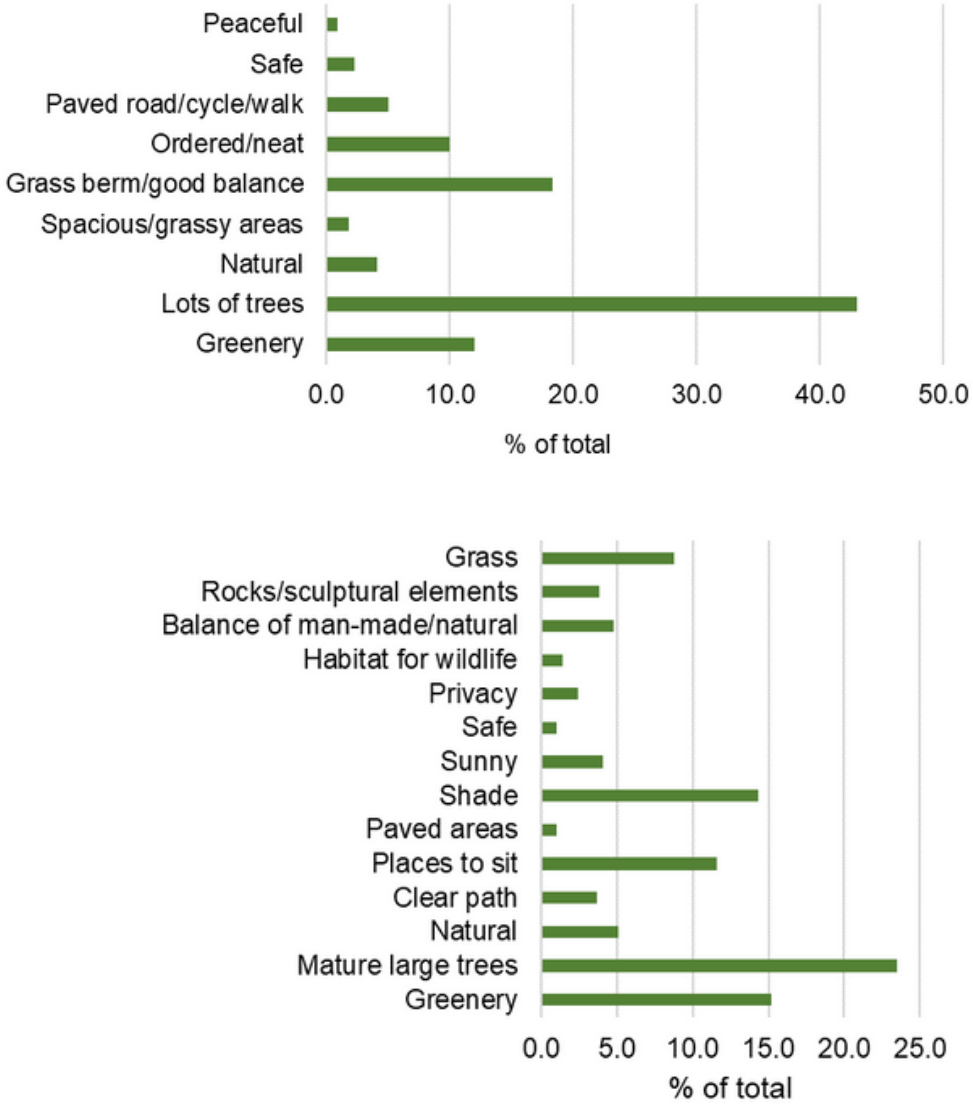

Figure 7. Reasons given by study participants for selecting their preferred land cover type for residential streets (top) and public open spaces (bottom).

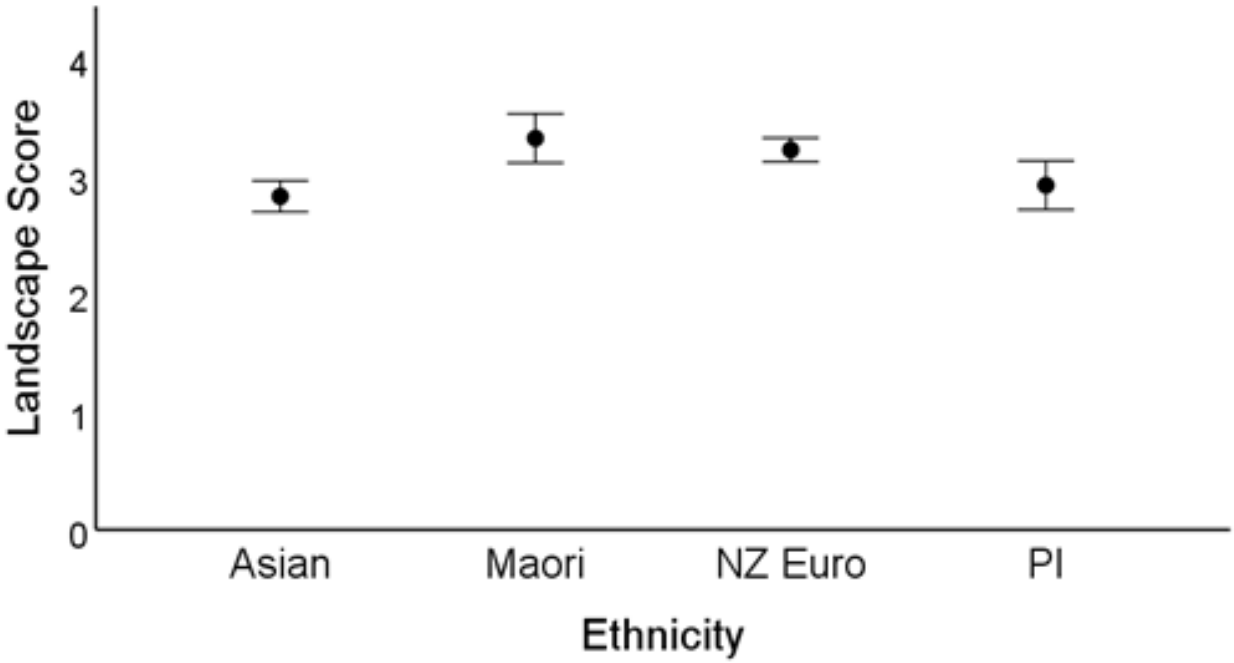

Fig. 8. Landscape preference scores for the different ethnic groups. Error bars are 95% confidence intervals. PI = Pacific Islander

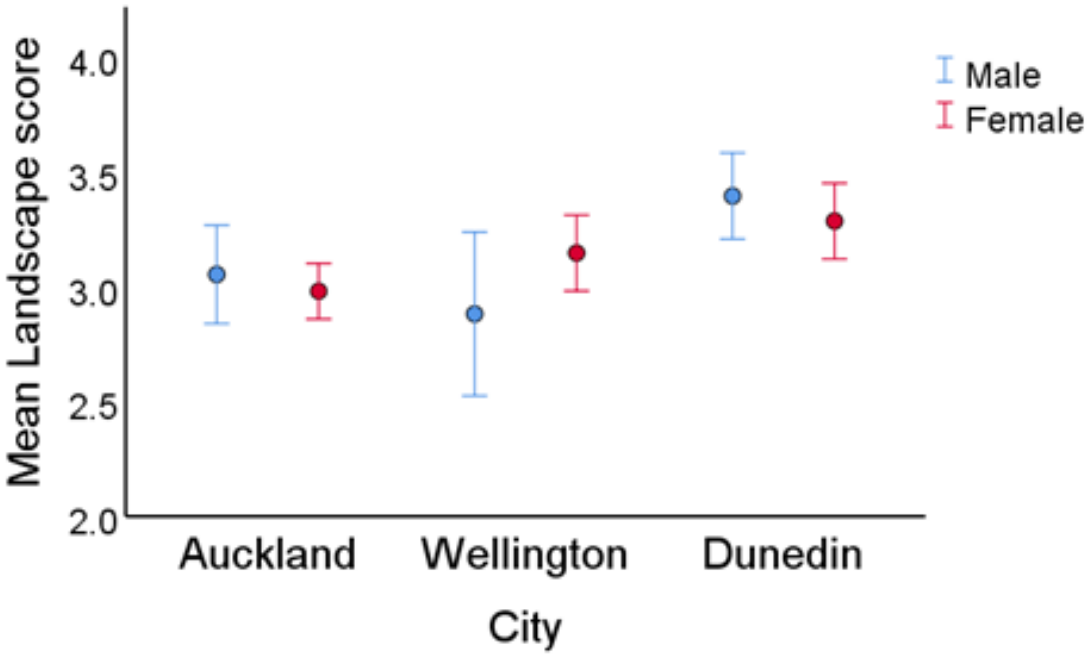

Figure 9. Landscape preference scores of participants from each city; error bars are 95% confidence intervals

There were also differences between landscape preference scores of people from the three cities (Fig. 9); people from Dunedin had the highest scores, although this could be because a larger proportion of the Dunedin sample was comprised of NZ Europeans and Māori, which were the groups with the highest scores.

Research Question 3: What are the species that are both familiar to and valued by diverse groups?

When asked to choose the five most familiar birds out of a selection of eight native and eight exotic urban species, most people selected three or more native species, although the Asian and Pasifika participants were more likely to select fewer (two to three native birds), whereas Māori and NZ Europeans/Pākehā groups tended to select more (Fig. 10).

Most participants said they selected native birds because they saw them in their backyards, neighbourhoods or places they frequented. For Māori, having a cultural connection with the bird was important. When asked what birds they would like to see more of, most participants wanted to see more native birds in general, such as kererū (the Asian and Māori participants) and tūī (NZEuro/Pākehā and Pasifika participants). Regarding plants, the largest proportion selected three native species, but compared with birds, fewer native species were selected (Fig. 11).

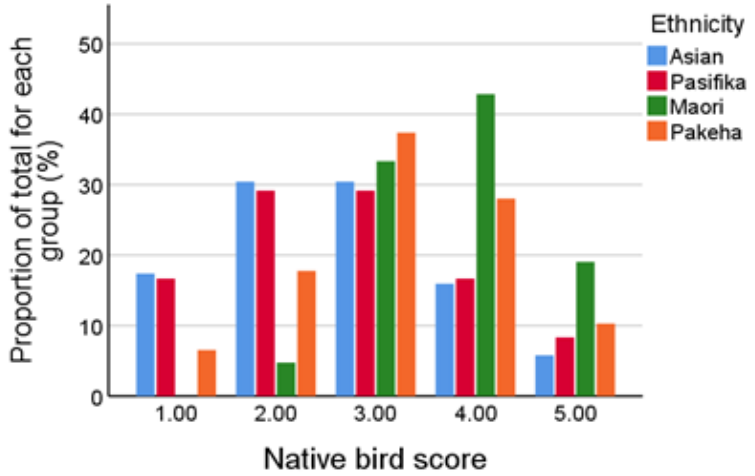

Figure 10. Percentage of native birds (out of a possible five) selected based on familiarity, per ethnic group

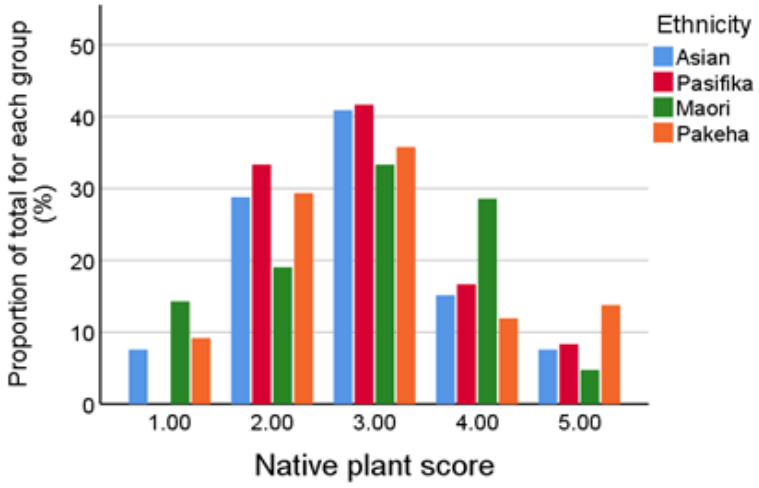

Figure 11. Percentage of native plants (out of a possible five) selected based on familiarity, per ethnic group

2

Families

- Which open spaces do multi-generational families use and why?
- Identifying preference for native species and more natural spaces over formally landscaped spaces.
- Evidence of family place attachment to natural spaces, and demographic variability by life phase.

Researchers: Yvonne Buttery, Claire Freeman, Yolanda van Heezik

Background

There is an implicit assumption in greenspace provision, planning and assessment that all green spaces are equally available to all residents. Further, blue spaces are often overlooked where the focus is just on greenspace. Our previous studies with children and older adults indicate that different groups use spaces very differently and have different needs. We wanted to identify these differences in families. The aim was to assess the different spaces and their associated biodiversity as used by children, adults and older people, so that there can be better greenspace and biodiversity planning at neighbourhood and city level. Multi-generational families are increasing and, in New Zealand, between 1996 and 2013, there was a rise of 142% in multi-generational living across all population groups. Understanding family dynamics and life stage in relation to open spaces can provide valuable insights for urban planners, conservationists and the range of professionals whose remit covers open space management and is essential to achieve good greenspace planning.

Methods

As part of a study examining inter-generational patterns in greenspace use, this survey was administered to 15 families where three generations lived either in the same household or nearby. This was important as all family members had to have access to the same greenspaces. Each family had a minimum of a child, a parent and a grandparent and all lived in very close geographic proximity. In focusing on families where all members were able, theoretically, to access the same range of open spaces we expected to tease out the life stage factors determining greenspace use, and identify whether an 'open space family character' emerges in reference to selection of more natural spaces. Some 15 families living across Dunedin were recruited, 57 participants, including 21 grandparents, 16 parents and 20 children. Family members interviewed per household ranged from 3-8 members. The youngest child was age 6. The interview was the same one used for the 'Greenspace use across different ethnic groups study' with a shorter version used for the children.

Results

Landscape preferences: There was an overall clear preference for less manicured and more vegetated habitats by parents and grandparents, with more mixed responses from children.

Species familiarity: When shown 16 photos of birds and plants (eight native and eight exotic) and asked to select the five most familiar to them, the most commonly chosen birds were usually native birds, and children were more likely to choose native plants compared to parents and grandparents (Fig. 12).

Natural space use: The places study participants visited the most often were beaches, public gardens, and parks and reserves (Fig. 13).

Usually the main purpose for adults was exercise, for children play and walking. Most times natural spaces were accessed with others, indicating social activities were very important, including picnics, meeting family and friends. The greenspaces all had nature interest but often the experience of nature was combined with other activities (Table 1).

In summary, participants showed greater familiarity with native species, and preference for more natural open spaces. Exercise and nature appreciation were the most frequent activity for parents and grandparents and play and walking for children. Preferred open spaces were located some distance from participants' homes and unevenly distributed across the city. Planners will need to consider how to better provide multi-purpose natural open spaces spread more evenly across the city.

Figure 12: Species most familiar to study participants.

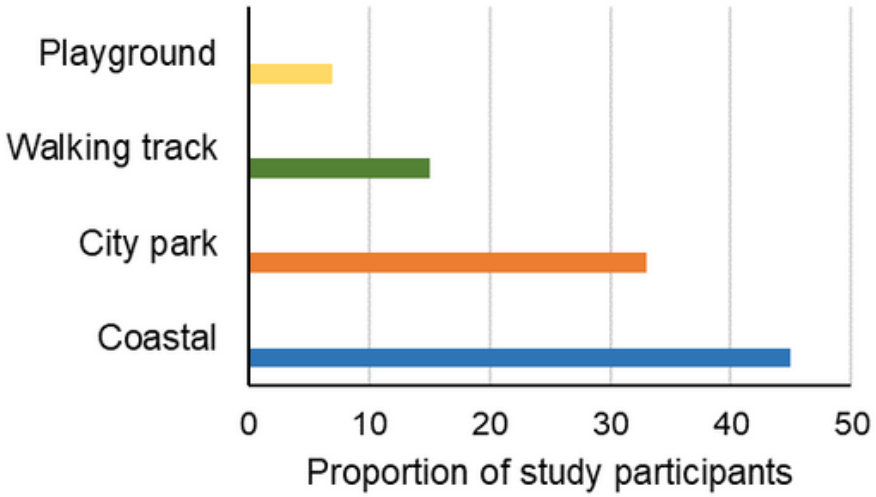

Figure 13. Proportions of study participants visiting different urban open spaces

Table 1. The most frequently mentioned activities for three generations showing the number of times activities were mentioned. Nature is a composite category that includes mentions of wildlife, bird watching, trees, shells, stone, and ducks.

Grandparents		Parents		Children	
Exercise	84	Exercise	80	Play	35
Nature	78	Nature	76	Walk	33
Picnic	34	Take children to play	57	Swim/water play	27
Take children to play	32	Picnic	38	Nature	18
Relax	28	Relax	35	Family/friends/relatives	16
Walk dog	13	Walk dog	11	Picnics/BBQ/food	14
				Run	12
				Walk dog	11
				Sport	11
				Sand	9
				Cycle or scoot	9

3

Young Adults

- What are the attitudes of young adults towards biodiversity conservation and management?
- What are the attitudes of young adults towards engagement in pro-environmental behaviours and local and regional planning initiatives?

Researchers: Alice Falloon, Claire Freeman, Yolanda van Heezik

Background

This study examined engagement by millennials in pro-environmental activities and planning processes and identified barriers and motivations. Young adults are tasked with being future conservation champions; in just over a decade they will be at the forefront of environmental planning policy and decision-making. In recognising that young adults play an essential role in the future management of biodiversity, it is vital to understand their current awareness of biodiversity and engagement in environmental initiatives. This study explored young adults' awareness of biodiversity and engagement in biodiversity management initiatives, including the barriers and motivations to engaging them.

Methods

The primary methods were an online survey that was a modified version of that used in the Greenspace Use across different ethnic groups study. This was complemented by interviews with 11 key informants from national and community environmental management groups. The survey collected information on demographics, and ascertained the degree of engagement of this group in pro-environmental activities, such as whether they belonged to an environmental group, followed environmental groups on social media, or engaged in various pro-environmental activities, and environmental and planning strategies (Falloon, 2019). We also obtained information on the following: awareness of biodiversity and biodiversity management strategies, attitudes towards green space provision and government investment into biodiversity protection and childhood nature experiences. The key informant interviews were important to explore the relationship between community environmental groups, governmental environmental groups and young adult populations, and consisted of both young adults and older adult informants.

The survey targeted young adults aged between 18 and 25 years, mostly university students in Dunedin and Hamilton (178 females, 57 males).

Results

Engagement – motivation: Young adults (286 adults aged 18 to 25 years) supported many biodiversity enhancing activities (Fig. 14). Working directly with animals was usually considered a desirable activity whereas trapping and killing pest species fell outside their concept of positively working with animals. Young adults were most interested in minimising waste and planting (Fig. 15). Minimising waste has been highly promoted as a way for people to do their bit for climate change and young adults appear to be taking this on board and increasingly engaging in this action.

Barriers to engagement: When key informants from environmental groups were asked if there were any barriers to them reaching out to young adults, many mentioned that there was low capacity for

outreach due to funding cuts and annual briefs that did not cover public outreach and engagement. The low capacity resulted in a lack of on-the-ground staff to facilitate public education and engagement strategies for different sectors of the community. Moreover, most young adults did not have the skills required for hands-on biodiversity management such as fencing, trapping, pesticide/herbicide, and chainsaw skills. To overcome these deficiencies, there would need to be groups willing to teach these skills to young adults or student environmental groups.

Major barriers identified by young adults were lack of awareness, lack of time, and lack of transport. In total 92% of young adult survey participants said environmental groups needed to be more accessible (better advertised, cheaper or more organised). Young adults are consistently left unaware of the opportunities to get involved, leaving them feeling removed from many key aspects of community environmental management. Strategies suggested by young adults to facilitate engagement are in Figure 16.

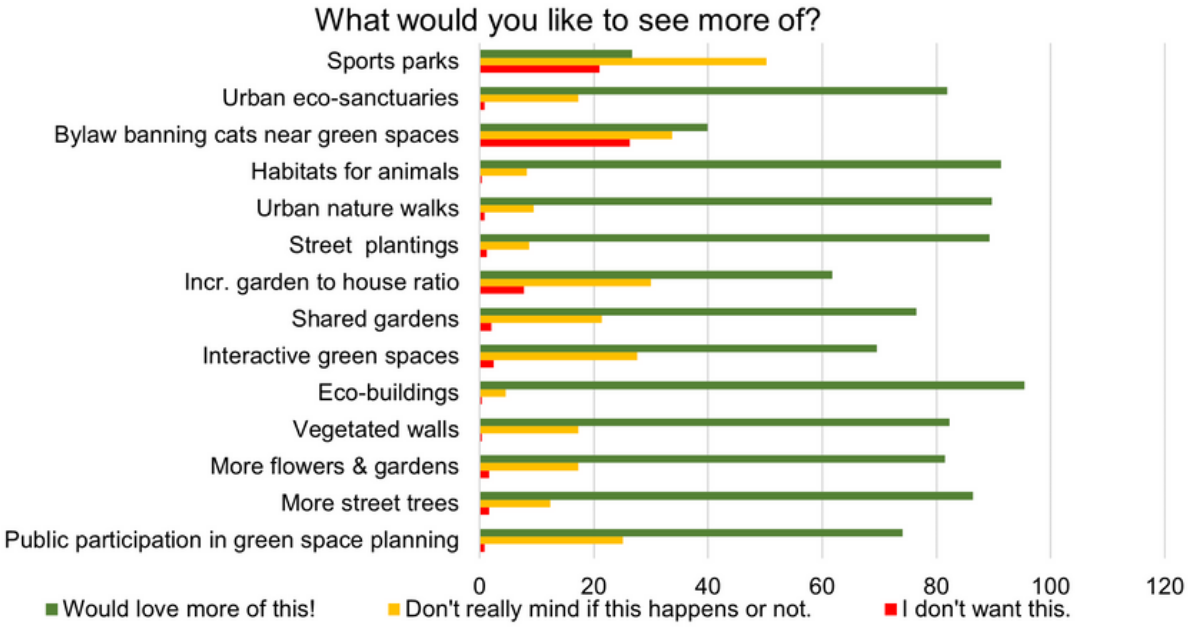

Figure 14. Proportions of young adults indicating support for different biodiversity-related features in urban areas

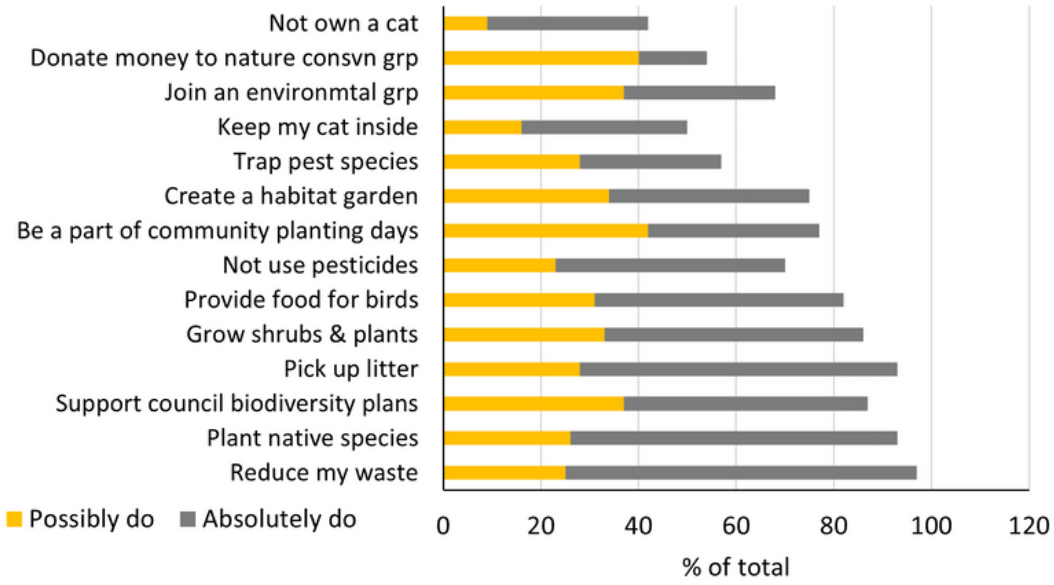

Figure 15. Proportions of young adults indicating support for different biodiversity-related activities

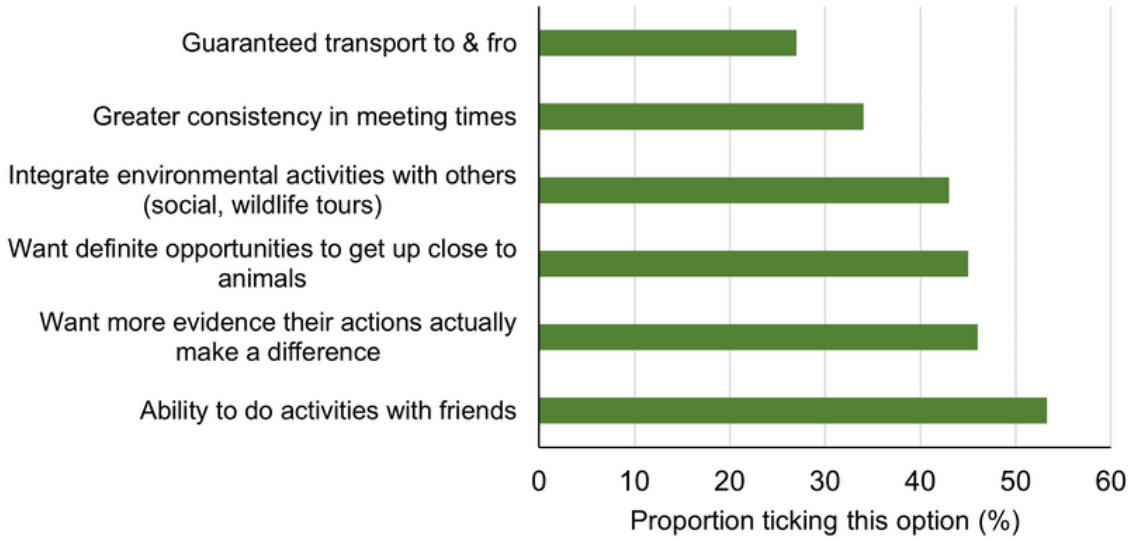

Figure 16. Support for strategies to improve engagement of young adults in pro-environmental activities

Formal planning and young adult engagement: Formal planning processes to conserve and manage biodiversity in NZ are seen as inaccessible by young adults and input is not actively sought from this age group. When asked if they would support council biodiversity plans, 50% of young adults stated that they would definitely support council strategies if they knew about them. More positively, an overwhelming 97% of young adults thought that young adults of today would take stronger environmental action in comparison to current leaders.

We suggest engagement of young adults could be improved through the following planning actions:

- Provide greater **opportunities** for young adults to be educated about biodiversity
- Develop a tangible **action plan for engaging young adults** in association with city council or regional council biodiversity strategies - this could act to direct young adults to what they can do to help
- Centralise the ability for young adults to engage through an **app or volunteer service**
- Emphasise the **meaningfulness** of projects and initiatives
- Look into practical responses to **overcoming barriers** to engagement

4

Barriers & Drivers

- What are the barriers to and drivers of biodiversity management by householders in private gardens?

Researchers: Katherine Davidson, Blake Lewis, Claire Freeman, Yolanda van Heezik

Background

Private gardens have enormous potential to support urban biodiversity and ecosystem function, although there is considerable variation in the vegetation composition, structure, and diversity across gardens, all of which influence faunal diversity. Private gardens cumulatively comprise the largest green space in many cities, and the biodiversity they support is influenced by interacting economic, social, and cultural factors, and the values and attitudes of the people that occupy and manage these spaces. The decisions made by householders can have more impact on vegetation and avian richness and abundance than do environmental characteristics (e.g. aspect, slope, and drainage). Further, the ability to harness individuals' management activities is seen as a major challenge in urban ecosystems.

Attitudes and motivations driving the pro-environmental garden activities of residents must be understood before any attempt can be made to encourage householders to modify their activities to benefit backyard biodiversity. In this study we focused on backyard biodiversity management, the barriers and motivators. Activities undertaken by householders in their gardens have huge potential to enhance citywide biodiversity, but programmes aimed at activating householders require an understanding of the factors encouraging or acting as barriers to the uptake of different kinds of activities.

Methods

Study participants (n = 42) were recruited from two suburbs in Dunedin, New Zealand. Participants could choose any two out of six species-enhancing activities: a bird feeder (PekaPeka®), an artificial cover object and an appropriate shrub to serve as a lizard refuge and habitat (Lettink and Cree 2007), two native shrubs, a planter containing three flowering plants known to be attractive to native (and non-native) bees (e.g. lavender and other non-native flowering plants), a pile of logs to create invertebrate habitat, and a tracking tunnel with three ink cards, to monitor the presence of mammalian pests (Fig. 17). It was assumed that an awareness of pest species could provide the motivation to trap these species.

These activities were provided free-of-charge, and assistance was given to set them up. Each activity was accompanied by an attractive information pack, which included further ideas on how to extend the activity, links to online information and resources, and a link to a Department of Conservation Facebook page set up specifically to encourage urban residents to share experiences and information about garden species. These opportunities were made available to facilitate further engagement. Participants were asked to explain the reason/s for their selection, and to fill out a questionnaire.

The questionnaire was used to gather information about the study participants: age, gender, level of education, socio-economic status, extent of their engagement in environmental activities, how they valued their gardens, whether they were already engaged or would consider

engaging in wildlife gardening activities, their knowledge about common species and their level of nature connectedness. One month later we evaluated level of engagement with the selected activities, barriers to engagement and outcomes of having participated in the study. This process was repeated again at 6 months.

Figure 17. The different species-enhancing options: (a) a sugar-water feeder; (b) a refuge for lizards with a lizard-appropriate plant; (c) a planter with bee-friendly flowers; (d & e) a tracking tunnel with ink cards; (f) two native shrubs; and (g) a log pile for invertebrates.

Results

Bird feeders and planters for bees were the most popular options, perhaps because they were also the most expensive ones! Figure 18 shows which options were chosen.

Bird feeders were most likely to be chosen by people with poor knowledge of common local species, and of lower socio-economic status. People who opted for the bee planters were more likely to have a low score for participation in pro-environmental activities: even though the bee planter involved colourful non-native species, it is an activity that might appeal to people who do not have a strong pro-environmental orientation, but which can still provide benefits for urban native species. Those opting for the lizard refuge and plant were more likely to already be engaging in a number of wildlife-friendly gardening practices. More affluent householders who value their gardens highly are more likely to be interested in establishing lizard habitat.

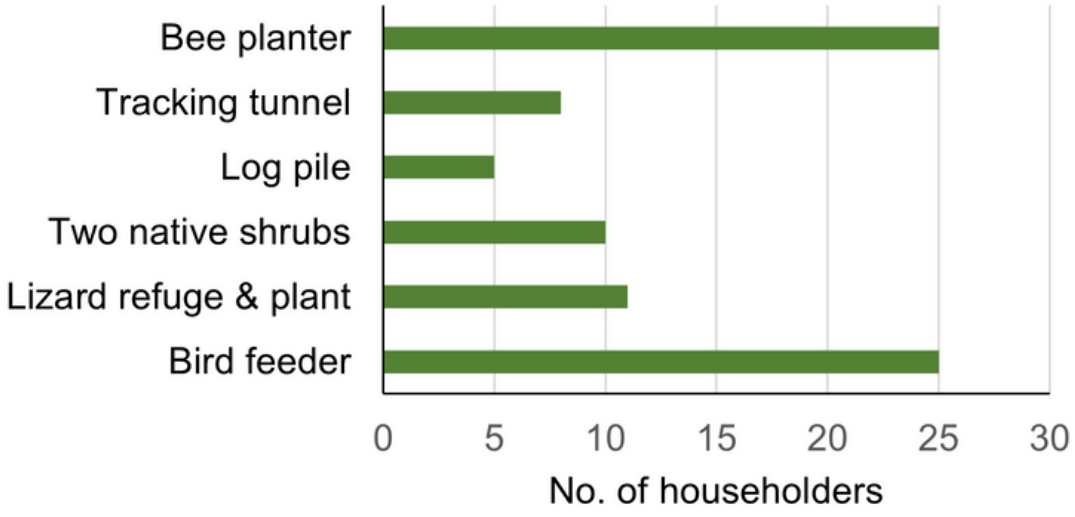

Figure 18. The number of householders who chose each of the biodiversity-enhancing options

Creating lizard habitat was a very popular option as an activity that householders would consider doing. Native shrubs were selected by people who were keen to contribute to nature conservation. Tracking tunnels were less popular: predator detection might have been seen as less relevant to achieving the nation's predator-free goal than trapping. Very few participants chose the log pile option, which was intended to provide habitat for invertebrates, although creating bug hotels did rank as a popular activity that people would consider doing. Bug hotels are likely to be more aesthetically pleasing than piles of rotting logs, and could be more successful at engaging people in invertebrate conservation.

Cost to continue with activities was a significant barrier for some people, but most householders were willing to practice relatively inexpensive activities in small spaces. Aesthetics was an important factor to be considered when enhancing invertebrate habitat (e.g., bug hotels are more attractive than log piles, and planters for bees contain colourful flowers). A commonly cited barrier was lack of information about wildlife-friendly activities, despite much being available online. Most participants (85%) talked about their activities with others, potentially acting as influencers and shifting social norms. Participants were asked to indicate their willingness to try a number of different activities (Fig. 19).

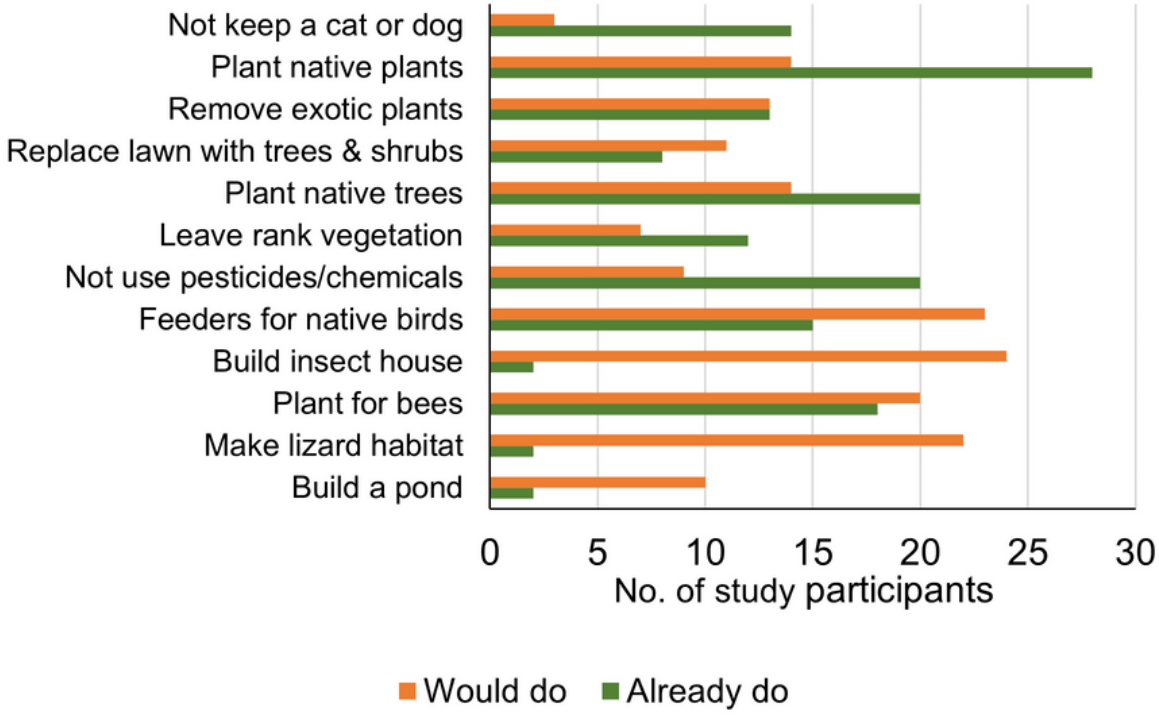

Figure 19. Number of biodiversity-enhancing activities householders reported either already doing or they would consider doing

Recommendations

Messages for New Zealand in supporting wider urban biodiversity

The time that study participants spent in natural spaces, reasons for visits and the qualities of the nature spaces enjoyed, were remarkably consistent, despite variations in age, socio-economic status, level of education, gender and childhood experience of nature. None of these established predictors explained why some New Zealanders spent more time in nature than others, other than the Nature Related score, which was higher among people who spent more time in natural spaces. Residents in Auckland tended to spend less time in natural spaces than those in Dunedin and Wellington, possibly because spaces were less accessible.

There is a wide range of natural spaces in urban areas, including bush, sports field, school grounds, rivers, nature areas/reserves, beaches, town belts, parks, and gardens, and these can all be used and valued by many urban residents. There are some ethnic differences in terms of landscape preferences. As many natural spaces have multiple characteristics in terms of function, habitats, landscaping and biodiversity values it is possible for natural spaces to meet the needs of a range of ethnic groups. Nature appreciation emerged as a strong determinant of people's greenspace use, however this was often in association with other purposes such as a family walk, playing sport, dog walking, and relaxation.

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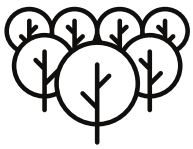
RECOMMENDATIONS

1

1. There is widespread use of green and blue spaces by all groups of the population, but less so in Auckland.

Recommendation:

Enhance greenspace provision and particularly provision of easily accessible greenspaces for all residents, ensure that as many as possible of these spaces also include areas of 'quality' indigenous habitats and species. Explore reasons for Auckland's lower use.



2

2. There was widespread preference for more biodiverse and vegetated landscapes.

Recommendation:

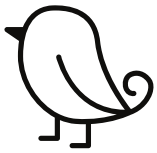
Support and provide more biodiverse landscapes in cities, e.g. street trees, parks, more woodland habitats, wetland habitats. Planting policy in public spaces could focus on greater and more diverse vegetation volume in multiple layers.

3

3. Green and blue spaces were all included as preferred spaces and these spaces included a wide range of public and private greenspace types.

Recommendation:

More even distribution of biodiverse greenspaces across the city, some parts of the city are lacking in natural spaces. Ensure that there are natural, less heavily managed (e.g. less pruning, mowing, spraying) and native habitats available in as many green spaces as possible. Undertake a city audit of vegetation and habitats present in green spaces in relation to residents home.



4

4. Native species were recognised and valued (birds and plants) although more highly among Maori and Pakeha than among the Asian and Pasifika groups. Fewer native plants were recognised and valued than native birds.

Recommendation:

Enhance plantings that include native species and or support native species on public land and across all suburbs. Audit species present in cities and devise programmes to support important identified species.

5

5. Young adults expressed significant levels of interest in being involved in biodiversity initiatives but are often unclear on where to find the information, how to become involved and despite their general interest in NZ biodiversity are unlikely to read environmental management and biodiversity plans unless they are part of their academic studies.

Recommendation:

Provide more accessible information on and opportunities for young adults, especially those in transient populations such as students, to engage with biodiversity initiatives. Provide information in young adult-friendly user formats, e.g. social media.

6

6. Most householders show substantial interest in making their gardens more biodiverse and given support and information are willing to change how they manage their gardens to support this.

Recommendation:

Develop householder support processes (e.g., financial in the form of subsidies, but also creation of social networks), information on management and the provision of native species to enable householders to enhance their private gardens to benefit biodiversity. Create incentives to engage people in biodiversity management.

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People, Cities & Nature is a world-leading research programme harnessing expertise from New Zealand and Australia to enhance restoration of indigenous biodiversity in cities.

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