

MRQ

Monitoring Research Quarterly

Monitoring Research Quarterly, MRQ is the newsletter of Auckland Council's Research and Evaluation Unit, RIMU. The newsletter contains reports of RIMU's current work including information about recent publications, research, facts and trends about Auckland. RIMU publications are available on the Auckland Council and Knowledge Auckland websites.

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Auckland's urban forest in 2013

RIMU has recently completed a preliminary analysis of the distribution, ownership and protection status of urban forest cover in the Auckland metropolitan area. This includes all the land area within the Metropolitan Urban Limit (MUL), excluding Waiheke Island.

The urban forest cover map was based on an analysis of 2013 LiDAR (Light Detection and Ranging) captured by Aerial Mapping Ltd. on behalf of Auckland Council. For the purposes of this analysis, 'urban forest' comprised all urban trees and shrubs three metres or taller – including those in parks, coastal cliffs, stream corridors, private gardens and streets – both native and naturalised (i.e. exotic).

Figure 1 (page 2) shows distribution and height of urban forest cover within the Auckland metro area. The total land area of the Auckland urban area covered by this analysis is around 55,720ha and there is approximately 10,130ha of tree canopy more than 3m high across this same area. This means that urban forest covers 18 per cent of the urban area, including 11 per cent of road area, 24 per cent of public land and 18 per cent of private land.

The urban forest cover in individual suburbs varies widely across the city (Figures 1 and 2 on page 2). Figure 2 shows a concentration of suburbs with good urban forest cover in the north and west of the city, and poor urban forest cover for many southern suburbs. However, this is not a universal pattern; some southern suburbs have a relatively high urban forest cover (e.g. Totara Heights, 29%) and some northern (e.g. Wairau Valley, 7%) and western (e.g. Westgate, 8%) suburbs have a relatively low cover.

The topography and fertility of the underlying landforms have a strong effect on the current distribution of urban forest. Suburbs built on steeper, less fertile, clayey hillslopes have retained a greater proportion of their former forest

cover; mostly in deep gullies and on steep south facing slopes (e.g. Kaipātiki Local Board and the Hillsborough to Lynfield coastal margin). In contrast, suburbs established on gentler topography or more fertile land were almost entirely cleared for farms, orchards and gardens before being developed for urban use and therefore did not retain their former forest cover (e.g. most of south Auckland).

The intensity of development within the suburb – i.e. the density and size of buildings and the area covered by roads and carparks – also has an influence on urban forest cover. Many of the suburbs with a relatively low density of urban forest are dominated by light industry (e.g. Rosedale 8% and Penrose 7%) or dense, taller buildings and carparks (e.g. Newmarket 5% and central Manukau 7%).

Around a quarter (23%) of Auckland's urban forest canopy is on Auckland Council parkland, 9 per cent on road corridors and 8 per cent on other public land (e.g. schools). The remaining 60 per cent of the urban forest canopy is on privately owned land.

Around 50 per cent of the urban forest cover in the Auckland metropolitan area has no statutory protection and the remaining 50 per cent is protected in some way (Figure 3, page 2). Significant Ecological Areas (SEA) cover around one third of Auckland's urban forest and are the most important individual component (62% of the whole protected area).

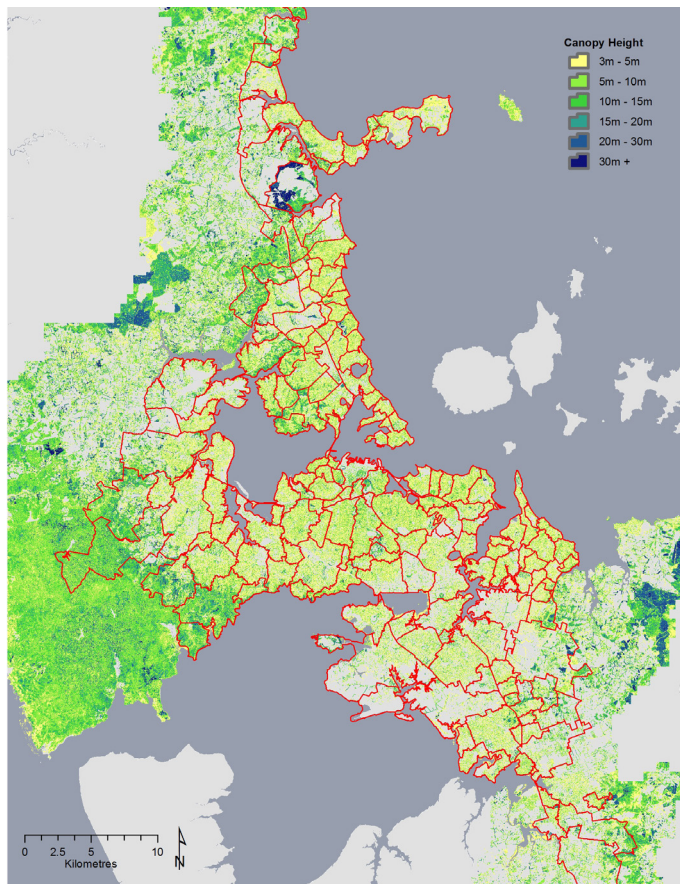


Figure 1: Auckland's urban forest. Colours show the maximum height of forest (in metres). Red lines show the suburb boundaries.

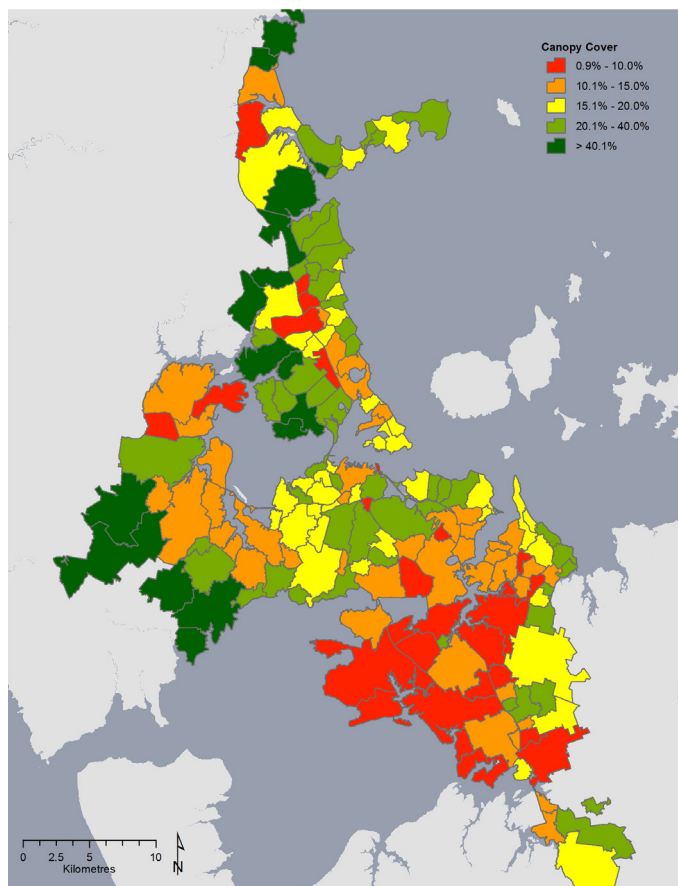


Figure 2: Average percentage canopy cover of urban forest (3m+ height) in mainland suburbs within the Auckland Metropolitan Urban Limit.

Figure 4 shows the height class distribution of Auckland's urban forest. Around half of Auckland's urban forest is less than 10m high and half is greater than 10m. Only about seven per cent of Auckland's urban forest canopy is greater than 20m in height. International research has shown that many of the benefits attributed to urban forest are disproportionately provided by larger trees. Large trees provide exponentially larger environmental benefits – such as carbon storage, area shaded by canopy and building cooling effect – compared to small trees of the same species; a typical 20m tall street tree may provide three to seven times the benefit of a 10m tall one, and these benefits continue to rise rapidly above 20m.

This data suggests it is critical to retain the larger trees and to ensure that future urban forest plantings are prioritised in locations that can provide for the growth of large trees; i.e. sites where they do not conflict with future buildings and other infrastructure.

Auckland Council technical report reference: *The Urban forest of Waitematā Local Board in 2013*, TR2017/006.

For more information about Auckland's urban forests, please contact Dr Craig Bishop, craig.bishop@aucklandcouncil.govt.nz

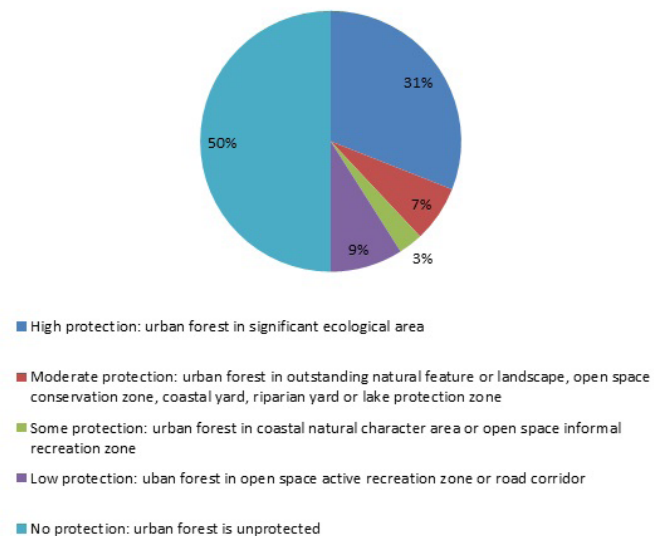


Figure 3: Proportion of urban forest under Auckland Unitary Plan protection

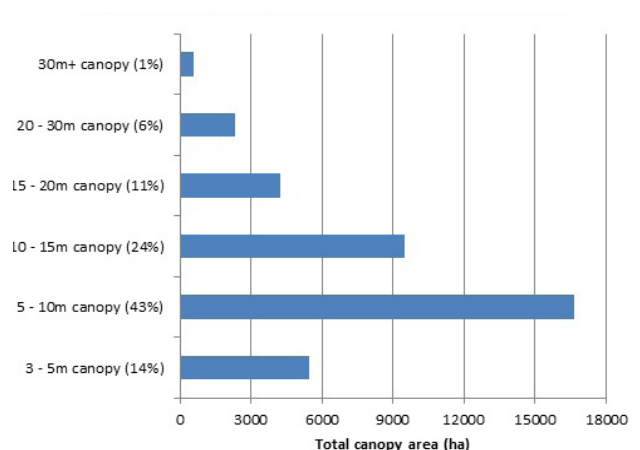


Figure 4: Height class distribution of Auckland's urban forest

Older Aucklanders: a quality of life status report

Older Aucklanders are a significant force in Auckland's economic and social landscape. They will continue to be so for several decades, as Auckland experiences population ageing, in line with broader national and international demographic trends. Auckland will be home to significantly more older people than ever before in the next few decades, and older people will represent a greater proportion of the total population. By 2033, the number of people aged 65 and over living in Auckland is anticipated to have doubled from 2013 levels, to reach over 350,000. Such proportionate growth is not anticipated in any other age group.

Auckland Council recognises the contributions, as well as the challenges, that an ageing population can bring. The Auckland Plan includes a directive to recognise and value the contribution of older people to the community, and an action to develop a report on the status of older people in Auckland. To that end, RIMU researchers worked with members of the Community and Social Policy team to prepare the recently published *Older Aucklanders: a quality of life status report* (Auckland Council technical report, TR2017/014).

This comprehensive report, which focuses on Aucklanders aged 65 and over, provides a baseline for future reporting and aims to generate discussion. It presents more than 40 indicators of well-being over eight broad domains, or themes:

- housing
- neighbourhood
- transport
- social connectedness
- health and care
- status in society
- culture and identity
- economic standard of living.

Although presented separately these are of course, intricately inter-connected. The domains complement the goals of the New Zealand Government's Positive Ageing Strategy, but are focused on Auckland, which is unique in the New Zealand setting due to its large, multi-cultural and predominantly urban population.

The inclusion of indicators relating to older Aucklanders' perceptions of living in Auckland is an important element. As well as data from official statistics such as the New Zealand Census of Population and Dwellings and Te Kupenga, Statistics New Zealand's survey of Māori well-being, many of the indicators are based on results from a survey of 846 older Aucklanders undertaken by Auckland Council in 2016. Residents' perceptions of various aspects of living in Auckland such as transport, housing, social connectedness and levels of trust in others adds depth and relevance.

Housing is an important theme. The ability to access quality affordable housing solutions is crucial to ongoing health and sense of well-being. The report shows that levels of home ownership among older Aucklanders are higher than the rest of the adult population, but are gradually decreasing over time. For example, in 2001, 72 per cent owned the dwelling they lived in. This figure had dropped to 67 per cent by 2013. Almost one in five respondents to the survey (17%) disagreed that their housing costs were affordable and 18 per cent disagreed that they could afford to heat their home properly during winter. There needs to be a range of appropriate housing solutions available including options for secure long-term rental tenure in which older people feel safe and secure.

Another important theme relates to social connectedness. Mental, emotional and spiritual well-being among older Aucklanders is enhanced by meaningful social outcomes. In addition, Auckland is a multi-cultural society and it is important that older people from all ethnic, cultural and religious backgrounds can remain connected to their traditions and culture in a positive way. Our survey found that the majority of respondents (80%) belonged to one or more social networks or groups – 39 per cent of this group belonged to a hobby or interest group. Technology can be a vital communication tool – almost three quarters (72%) of respondents had access to the internet, and of this group 72 per cent said they used it every day.

The *Older Aucklanders* report provides a useful foundation upon which Auckland Council can continue to trace the quality of life of older Aucklanders, as Auckland responds to what will be several substantial changes over the next ten years, and beyond.

The report is available on Knowledge Auckland and for more information about the survey results, please contact Alison Reid, alison.reid@aucklandcouncil.govt.nz



Recent research activities

RIMU's scientists, researchers, technical specialists and analysts have assisted with many Auckland Council projects over recent months. A list of recent publications and research related activities follows. The reports noted here are available on the Knowledge Auckland website.

New reports

- *Auckland Council elections candidate experience survey 2016*, TR2017/004
- *Auckland east coast subtidal reef monitoring programme: 2007 to 2013*, TR2017/002
- *Auckland's rainbow communities: challenges and opportunities*, TR2017/012
- *Beach change in the Auckland region: current state and trends*, TR2016/048
- *Comparison of methods used to detect the organism responsible for kauri dieback, *Phytophthora agathidicida*, from soil samples*, TR2017/019
- *The demographic characteristics of Auckland Council candidates and elected members*, TR2017/017
- *Exploring Pacific entrepreneurship: the characteristics and experiences of Pacific entrepreneurs in Auckland*, TR2017/010
- *Immigration, ethnic diversity and cities: a literature review for Auckland Council*, TR2017/008
- *Marine water quality annual report 2015*, TR2017/015
- *Older Aucklanders: a quality of life status report*, TR2017/014
- *Pacific people in self-employment in Auckland*, TR2017/009
- *The relationship between pedestrian connectivity and economic productivity in Auckland's city centre*, TR2017/007
- *Residential property management in Auckland*, TR2017/018
- *River ecology monitoring: state and trends 2003-2013*, TR2017/011
- *Source apportionment and trend analysis of air particulate matter in the Auckland region*, TR2017/001
- *Elemental analysis results for air particulate matter collected in Auckland 2006-2015 – a summary report*, TR2017/001A
- *The urban forest of Waitematā Local Board in 2013*, TR2017/006

Research reports expected soon

Air quality related reports

- *Auckland air emissions inventory for transport and domestic home heating for 2016*
- *Auckland industrial air emissions Inventory for 2016*
- *Auckland's greenhouse gas inventory to 2015*
- *Port-related air emissions for Auckland for 2016*

Other reports

- *Arrested (re)development? A study of cross lease and unit titles in Auckland*
- *Auckland's regional wetland layer 2010/11: methods and summary (A report on the new GIS map layer for Auckland wetlands.)*
- *Creative sector 2017 industry snapshot for Auckland*
- *Muriwai Beach to Te Henga (Bethells) 2016 grey-faced petrel and little penguin survey*



Lake Pupuke

- *Probability of occurrence of acid sulphate soils in the Auckland region*
- *Renting affordability in Auckland: who will teach our children? A discussion paper*
- Knowledge Auckland, RIMU's research information website, has been updated with a new design, improved search capability and an information subscription service. Go to www.knowledgeauckland.org.nz to see the changes and explore our online research resources.
- We hosted two RIMU Insights presentations:
 - Professor Arthur Grimes on *Valuing sunshine: implications for intensification*
 - Professor Karen Witten and others on the *Realities of renting* and launch of the BRANZ, *New Zealand rental sector report*
- The RIMU symposium, *Today's evidence for tomorrow's Auckland*, held on 4 July included presentations by:
 - Sir Peter Gluckman: *Principles and structures of science advice - placing within a city perspective*
 - Professor Richard Bedford: *Reflections on a revolution: Auckland's population 2013-2033*
 - David Norman, Auckland Council Chief Economist: *Beyond home ownership*

Symposium presentations are available on Knowledge Auckland.

- Air quality scientists are working with council's Community Services, Parks and Auckland University science colleagues on a pilot study investigating the use of vegetation boarders as passive filters for traffic pollutants.
- The Cultural Values Assessment (CVA) research project continues (see article on page 6). Focus groups with planning teams are complete and RIMU researchers are now working with iwi on a contact log which will record day to day work of responding to requests for CVAs.
- Responding to requirements of the National Policy Statement for Freshwater Management and the Auckland Unitary Plan, RIMU scientists will monitor the water quality and ecology of Lake Whatihu (Manukau) and a Hunuas water reservoir. – The first time council has monitored a reservoir, a man-made water body.

Monitoring Auckland's rivers and lakes

Auckland's rivers, streams and lakes encompass all the surface freshwater of the region's 4900km² area, from Wellsford in the north to Franklin in the south. With an estimated 16,500km of flowing rivers, and 72 lakes, these water bodies are an important part of Auckland's natural environment.

RIMU monitors 35 river and stream sites monthly, in a network designed to report on the overall ecological state of streams including the impacts of sediment and heavy metals from Auckland's extensive urban environment.

Quarterly monitoring of six lake sites also provides good water quality data and an assessment of the lakes' general environmental health as some are popular swimming spots and areas of ecological significance.

Omaru Creek contaminants project

RIMU's stream water quality monitoring site at Omaru Creek, Point England has indicated a high level of microbial, heavy metal and nutrient contaminants. We're also working with the Healthy Waters Department on a study that will identify contaminant sources and four new monitoring sites will help track contaminants.

Auckland Council is also working with Watercare to improve understanding of waste water influences in aquatic systems. Data from this project will inform the Stormwater Catchment Management Plan for the Omaru Creek area.

Lake Pupuke monitoring projects

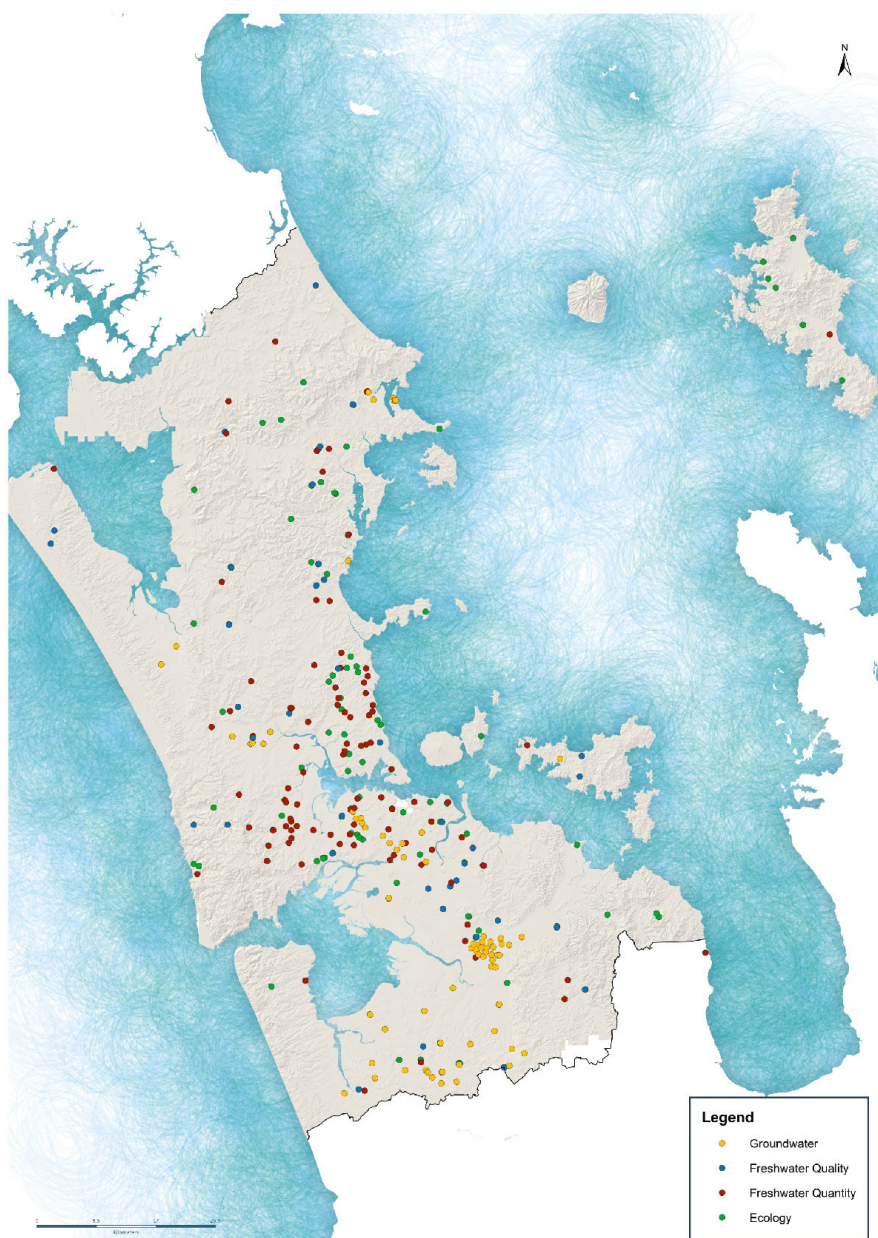
Lake Pupuke is a unique volcanic lake and a valued recreational water body – it was an important venue for the 2017 World Masters Games. The lake has an entirely urban catchment and so it is under increasing stress from the many environmental effects of nearby human activities. This "community effects" problem has been identified by both the public and Auckland Council.

RIMU scientists have started a monitoring project which incorporates community driven citizen science where local people collect and report environmental monitoring data. This initiative and current state of the environment monitoring will help identify important issues and help develop effective management strategies for Lake Pupuke.

Quarry Lake monitoring project

RIMU and Healthy Waters have begun a project to establish a baseline ecological state for Quarry Lake, Takapuna. The lake is frequently used for recreation and is home to the Auckland Canoe Polo Club and the Auckland RC Boat Club. Quarry Lake too, was a 2017 World Masters Games venue which confirmed its place as a high-value recreational water body.

Community concerns about the lake's water quality and general ecological health have resulted in a combined effort by RIMU, Healthy Waters, Parks, Community Facilities and NIWA to identify important issues. RIMU and Healthy Waters have now collated the issues and developed a monitoring programme that will help establish baseline ecological data which will be used to monitor any mitigation measures initiated and if the measures are effective.



Auckland Council's freshwater monitoring sites



Quarry Lake

Mana Whenua Cultural Values Assessment Project

'Mana Whenua values', which can also include cultural heritage and ancestral lands, are understood as concepts that influence Māori knowledge and customs. These values are important in planning because of the special cultural and spiritual relationship Mana Whenua have with the environment. This can include Mana Whenua relationships to sites, lands, water, waahi tapu (sacred sites) and taonga (treasures).

Resource consent applicants and Auckland Council are required to recognise and provide for Mana Whenua values when preparing and considering all resource consent applications. The regulatory obligations to do so are linked to the Resource Management Act 1991 and the Auckland Unitary Plan.

A Cultural Values Assessment (CVA) is sometimes required to articulate Mana Whenua values – this research focuses on this part of the resource consent system. The aim of the project is to understand the extent to which Mana Whenua cultural values and interests are protected and enhanced in growth and development decision-making in the Auckland context.

Outputs

Project outputs will enhance Auckland Council's effectiveness through:

- training materials that will improve the capacity of resource consent planners
- Auckland Unitary Plan effectiveness monitoring
- "good news stories," information and training materials to inform the public about the positive contributions made by Mana Whenua to development outcomes in Auckland
- policy and academic publications.

Project governance

This research is a partnership between Auckland Council and Ngā Mana Whenua o Tāmaki Makaurau. The research team is led by RIMU's Carina Meares, Jacob Otter and Esther Rootham and supported by mentor, Associate Professor Michelle Thompson-Fawcett from Otago University. The team is working in partnership with council's Regulatory Services and Plans and Places. RIMU's role is to gather the evidence required to support Auckland Council's work in the protection of Mana Whenua cultural values and interests. A Steering Committee oversees the project, including four Mana Whenua representatives as well as Auckland Council senior management. The research plan and progress is reported regularly to the Mana Whenua Cultural Values Implementation Group.

Methods

A number of different methods are used to gather evidence. A review of the literature in this area, prioritising local scholarship where possible but looking too at relevant international examples of good practice, will provide a foundation of existing knowledge.

Eight Mana Whenua groups will complete a CVA contact log, noting all CVA activity over three months and providing a detailed picture of the broader CVA system. Focus group hui and interviews will be held with Auckland Council Resource Consents staff; Mana Whenua; consultant planners, engineers and surveyors; and resource consent applicants. From this fieldwork a list of best and worst resource consent cases will be compiled, in collaboration with the Steering Committee. These cases will then be analysed in depth and used to test and refine a monitoring matrix initially developed in 2015 by Nathan Kennedy. Co-design workshops will then be held with Mana Whenua and Regulatory Services to identify the characteristics of best practice that will in turn inform the development of training for Auckland Council planners. The communication of Mana Whenua contributions to good planning outcomes will also be a focus of these workshops.

For more information about the Cultural Values Assessment Project, please contact Dr Carina Meares, carina.meares@aucklandcouncil.govt.nz

Acknowledgements

Thanks to Grant Lawrence for the maps on pages 2 and 5, and to Ebi Hussain for the lake photos on pages 4 and 5.

For more information about Auckland related research, data and monitoring programmes visit the Research Unit's websites:

Knowledge Auckland

www.knowledgeauckland.org.nz

State of Auckland

<http://stateofauckland.aucklandcouncil.govt.nz>

Auckland Counts, census data

www.censusauckland.co.nz

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