

Contents

<i>Monitoring Research Quarterly</i> , Auckland Council's research newsletter	1
Recent research activities	1
New record for the river ecology monitoring programme	2
Children in the Auckland region	3
Population density: are we talking about the same thing?	4

Monitoring Research Quarterly, Auckland Council's research newsletter

This is the first Auckland Council edition of *Monitoring Research Quarterly*, the newsletter of the Council's Research, Investigations and Monitoring Unit. Each edition of the newsletter will include reports on the Research Unit's current work including information about recent publications, research, facts and trends about the Auckland region.

The Research, Investigations and Monitoring Unit leads the evidence gathering functions of the council. We are the Auckland Council's environmental, social, economic and cultural research centre. We provide the high-quality evidence that assists policy development, implementation and evaluation.

Recent research activities

The Auckland Council was established on 1 November 2010 and during the following five months the Research, Investigations and Monitoring Unit led and assisted with many projects. Some of our activities are listed below.

- We collated and analysed evidence for the Auckland Plan, creating the Auckland Plan *Evidence Base Spider Map*, *Metadata Report* and *Bibliography*. All are available on the Knowledge Auckland website at www.knowledgeauckland.org.nz
- We researched Auckland facts and provided advice for many sections of the Auckland Plan discussion document, *Auckland Unleashed*, and for the *Did You Know?* animation video.
- In January, most research teams moved from the Pitt Street building to the Strand building, Takapuna. We now enjoy the best Auckland views on level four of the Strand building!
- The Research Unit published regular reports on the Auckland economy. The March edition is available on the Knowledge Auckland website at www.knowledgeauckland.org.nz
- We also monitored the built environment, Auckland region communities, hazards, Auckland's heritage and transport. The Monitor Auckland website contains full details of our monitoring programmes, <http://monitorauckland.arc.govt.nz>
- We wrote background reports for the Ethnic Peoples and Pacific Peoples advisory panels.
- Our scientists published demographic, marine and fresh water report cards for Local Board areas. The report cards are available on the Knowledge Auckland website at www.knowledgeauckland.org.nz
- We advised Statistics New Zealand on how the cancellation of the 2011 Census will affect the Auckland Council's population projections and research and advice initiatives.



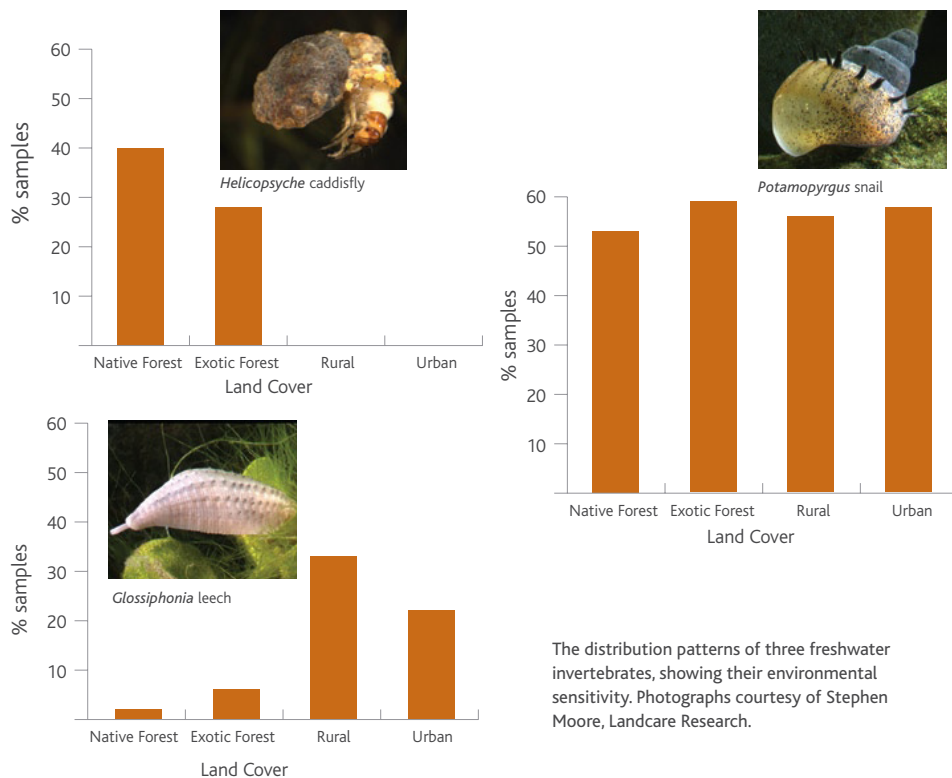
New record for the River Ecology Monitoring Programme (REMP) in 2011

The River Ecology Monitoring Programme has been running since 1999, it is a project inherited by the Auckland Council from the Auckland Regional Council. The REMP monitors the type and number of river invertebrates, which indicates the ecological quality of the sampled river.

Summer 2011 saw a record number of rivers sampled by the REMP field teams: Eighty-three sites sampled this year, with 17 new sites added to the existing network of 66 sites. The new sites were added to support the Auckland region Spatial Reporting Project, in particular to provide a more comprehensive evidence base for the local board area *Freshwater Report Cards*¹. Staff and students from the Research Unit's Environmental Services and Environmental Science teams collected samples and sent them to Landcare Research for identification.

Many species of invertebrates, such as insects, crustaceans, snails and worms live in rivers and have been used to indicate the ecological quality of rivers around the world since the early 1900s. Invertebrates are good river quality indicators because they are abundant, there are many different types (high diversity) and they each respond differently to various environmental pressures.

For example, in New Zealand the *Helicopsyche* caddisfly is extremely sensitive and found only in high quality rivers, while others, such as the *Potamopyrgus* snail are tolerant and can survive in a wide range of rivers. Some species, such as *Glossiphonia* leeches, are found mainly in degraded rivers with rural or urban catchments.



This differing sensitivity means that the types and numbers of invertebrates found in a river can be used as biological indicators to show the ecological quality of the river. The information generated from invertebrate sampling is complex, so it is usually summarised into an index. In New Zealand, the Macroinvertebrate Community Index (MCI) is used.

The MCI system assigns a score to each invertebrate found at a sampling site, based on its sensitivity to environmental stresses. The MCI score for a site is calculated from the average score for all the invertebrates found at that site. The theoretical range of MCI scores is 0 to 200 and the higher the score the better the ecology. In practice, the scores for Auckland range from 27 to 156, although 90 per cent of samples are between 54 and 138.

Provisional analysis of the 2011 samples indicates the best scoring site is on the Milne Stream in the Hunua Ranges (MCI = 147) and the worst scoring site for 2011 is Otara Creek (MCI = 46).

Previous REMP results are available in the *State of the Auckland Environment Report 2009* and ARC Technical Report 2008/10, *State of the Environment Invertebrate Report*.

Best practice indicates that to analyse river invertebrate data for trends, at least eight years of data is required. The collection of the 2011 data allows the REMP to meet this important milestone and the analysis of trends is planned for later this year. This will allow us to describe the ecological quality of our rivers and to determine if they are getting better or worse.

¹ The report cards are on the Knowledge Auckland website at www.knowledgeauckland.org.nz

2011 monitoring sites - the good, the bad and the ugly...

The good - Milne Stream



The bad - Otara Creek



The ugly - Pakuranga Creek





Children in the Auckland region

The children of today are the future residents, ratepayers, employees, employers, entrepreneurs, visionaries, planners and custodians of Auckland.

Childhood is a crucial life-stage when the foundations for future health, education, employment and social outcomes are laid. While local government does not have a direct role in providing health or education services, it does affect children's lives in a number of ways. For example, advocating on behalf of communities to central government agencies and stakeholders; planning for future land use and housing; providing transport links; monitoring air, land and water quality; providing open space, community facilities and libraries; promoting community development programmes and funding for new community initiatives.

The Auckland Council is aware of the need to include children and young people in regional planning. The Auckland Plan discussion document, *Auckland Unleashed*, has identified 'putting children and young people first' as a strategic priority for the region¹.

At the 2006 Census, almost one in five residents of the Auckland region were children. There were 288,573 children aged 14 years and under in the region, a third of all New Zealand children. The proportion of New Zealand children living in Auckland has increased over the last three censuses, from 29.4 per cent in 1996 to 31.4 per cent in 2001 and 33.3 per cent in 2006. This reflects an increase in the proportion of the national population who live in Auckland.

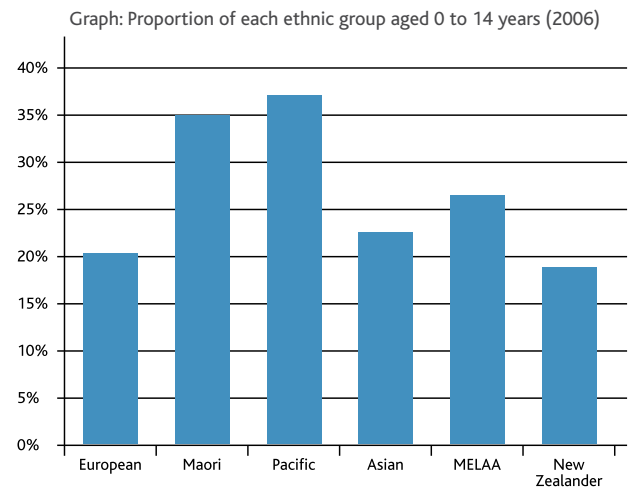
Of course, these figures are a snapshot of the population in 2006 and the distribution of children at certain ages has shifted since then. Children in the older age groups (10 to 14 years) will have moved into older age cohorts ('youth') while the size and composition of the under 5 year cohort is likely to have changed.

Statistics New Zealand population projections suggest that there could be 57,000 more children living in the region by 2031, an increase of 19 per cent from 2006 levels, making the projected number of children 355,230². All Auckland local board areas (except for Albert-Eden) can expect increased numbers of children, although at varying rates of growth. The Howick local board area, which currently has the largest local board population, and Otara-Papatoetoe are projected to have the highest growth in actual numbers – 10,950 and 7,940 more children respectively, while Waiheke, Great Barrier, Orakei and Devonport-Takapuna are projected to have the smallest growth in numbers.

Some ethnic groups in Auckland have higher proportions of children than other groups – particularly Pacific peoples. In 2006, 37.1 per cent of the Pacific ethnic group were children, compared with 35.0 per cent of Maori, 21.5 per cent of Asian and 20.5 per cent of European (see graph).

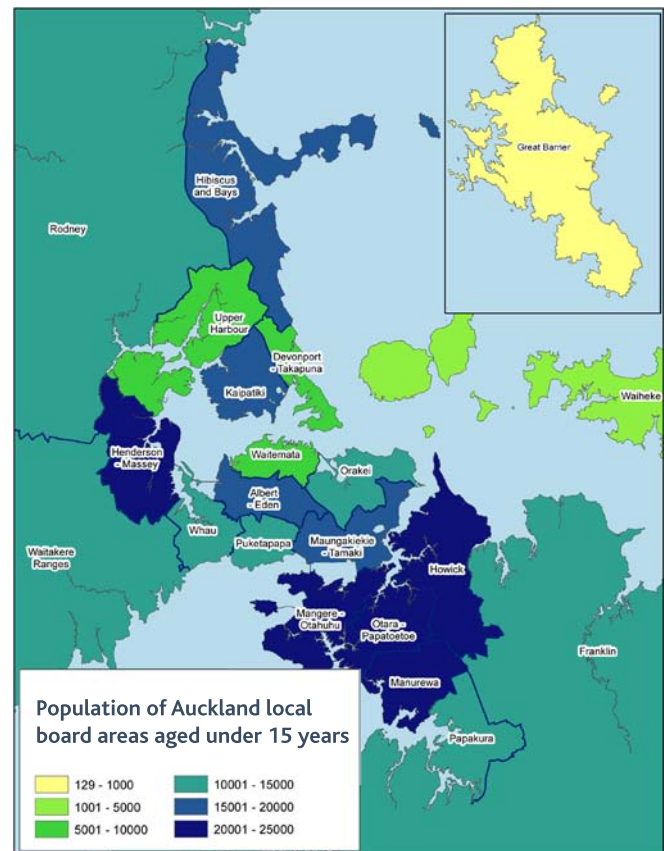
In 2006, Children and their families were concentrated in the western and southern areas of the Auckland region (see map). As the city grows, and as patterns of settlement change, there is a growing correlation between areas of high socio-economic deprivation, low income and poor education achievements with high concentrations of children and their families.

In 2006, Manurewa, Otara-Papatoetoe and Mangere-Otahuhu local board areas had the highest numbers, and highest proportions, of children living in areas rated 8, 9 or 10 on the *New Zealand Deprivation Index*³. The Henderson-Massey local board area also had a large number of children living in lower rated areas. Low socio-economic environments are often associated with poor outcomes for children and their families, including low levels of achievement at school, unemployment, higher crime rates and low perceptions of safety. These issues and trends are of particular concern and focus.



Source: Statistics New Zealand: Census of Population and Dwellings
Notes: Children could identify with more than one ethnicity so these categories are not mutually exclusive.
MELAA refers to Middle Eastern, Latin American and African

Map: Number of children in Auckland local board areas (using 2006 Census data)



¹ *Auckland Unleashed*, www.theaucklandplan.govt.nz

² Statistics New Zealand medium series

³ The *New Zealand Deprivation Index* is a composite of nine socio-economic variables using census data. For further information see the University of Otago, Wellington School of Medicine website, www.uow.otago.ac.nz/academic/dph/research/socioeconomicdeprivation.html

Population density: are we talking about the same thing?

Population density refers to the relationship between people and land or space. Population density is a factor in understanding how city areas function and it is linked to other population related topics such as health, economics and sustainability.

Auckland's population density

When calculating the Auckland region population density, four different geographical boundary definitions can be used, each giving a different result:

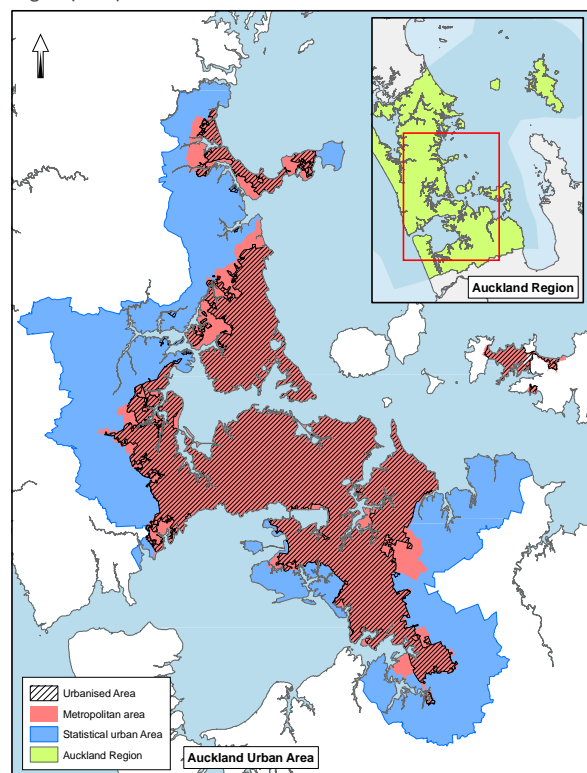
- the Auckland region as a whole, including rural and urban areas
- the metropolitan area, as defined by the Auckland region metropolitan urban limits (MUL)
- the statistical urban area, as defined by Statistics New Zealand
- the urbanised area, as defined by the extent of developed urban land, identified in aerial photographs.

The different land sizes (as illustrated in the map below) and resulting densities are shown in the table below.

Table: Auckland land areas and population densities

Area Definitions (2006)	Population (2006 Census)	Area (km ²)	Density (population per km ²)
Auckland region	1,303,068	4,998.9	261
Metropolitan area	1,160,751	559.2	2076
Statistical urban area	1,208,163	1,102.9	1095
Urbanised area	1,156,623	482.9	2395

Map of different geographical boundary definitions for the Auckland region (2006)



Comparing Auckland with other cities

A 2010 study¹ by Demographia, an international public policy consultancy, shows that Auckland has one of the highest population densities of any major urban area in Australasia with 2,200 persons per km².

Demographia's population density calculations are based on population estimates and the contiguous urban areas - identified in satellite and aerial photographs. Perth and Adelaide (which have similar populations to Auckland - 1,310,000 and 1,040,000 respectively) cover 94 per cent and 74 per cent larger areas than Auckland and have population densities of 1,200 and 1,400 persons per km² respectively.

Auckland is often compared to Australasia's other large city-region - Brisbane, which has a density

of only 900 persons per km²; and in New Zealand, the Hamilton urban area, has a much smaller population than Auckland but has the same density as the Auckland urban area.

All this shows that while it is possible to compare Auckland to any major urban area in the world, some comparisons are more useful than others. The size of the population, the size of the urban area and the urban area's development history should all be considered when making a population density comparison.

More information on Demographia's global city population densities is available on their website, www.demographia.com

For more information on population density, methodology and results, contact Craig Fredrickson in the Research, Investigations and Monitoring Unit.

¹ Demographia World Urban Areas and Population Projections, Edition 6. 1 July 2010, www.demographia.com



For more information about Auckland related research, data and monitoring programmes visit the Research Unit's websites, **Knowledge Auckland**, www.knowledgeauckland.org.nz and **Monitor Auckland** <http://monitorauckland.arc.govt.nz>

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