

Memorandum

3 August 2018

To:	Environment and Community Committee
Cc:	Jim Quinn, Chief of Strategy
Subject:	Update on several workstreams related to trees in Auckland's urban areas
From:	Sietse Bouma (Natural Environment Strategy) Matthew Blaikie (Chief Sustainability Office) Ruth Andrews (Plans & Places) Grant Lawrence (Research and Evaluation) Howell Davies (Community Services)

Purpose

1. To provide the Environment and Community Committee with an update on several workstreams related to trees in Auckland's urban areas.

Summary

- The Environment and Community Committee approved a Strategy for Auckland's Urban Ngahere (Forest) on 20 February 2018. The strategy aims to increase our knowledge of Auckland's urban ngahere and use that knowledge to protect, grow and maintain trees and other vegetation in Auckland's existing and future urban areas.
- The strategy identified 18 high level implementation actions to achieve strategy outcomes (grouped under three themes 'Knowing', 'Growing' and 'Protecting'), and recognised that collaboration, funding and partnerships are all fundamental to successful implementation.
- The Planning Committee received a report on the current and future regulatory and non-regulatory techniques of urban tree protection on 3 April 2018. Committee members endorsed the current approach to managing and protecting trees in Auckland, acknowledging that the Strategy for Auckland's Urban Ngahere includes seven actions to better protect trees in urban areas and that the efficiency of regulatory tree protection in Auckland's Unitary Plan will be reviewed as part of the Unitary Plan Monitoring project.
- This memo provides an update on several (but not all) workstreams covered by the 18 high level implementation actions included in the Strategy for Auckland's Urban Ngahere. These updates were requested by the Environment and Community Committee (20 February 2018) and the Planning Committee (3 April 2018).
- Staff will provide an update on the Unitary Plan Monitoring project to the Planning Committee in September 2018 and prepare a full progress report on implementing the Strategy for Auckland's Urban Ngahere for the Environment and Community Committee in August 2019.

Context/Background

Environment and Community Committee meeting of 20 February 2018

2. A well-managed, flourishing and healthy urban ngahere has a wide range of evidence-based benefits and is increasingly essential in counteracting the associated pressures of growth in urban Auckland. It plays a significant role in contributing to positive urban amenity and creating a healthy living environment with many social, cultural, economic and environmental benefits.
3. At its meeting on 20 February 2018, the Environment and Community Committee approved the Strategy for Auckland's Urban Ngahere and authorised the Chair, Deputy Chair and an IMSB member to review, make minor revisions and approve the finalised strategy for public release.

4. The strategy aims to increase our knowledge of Auckland's urban ngahere (e.g. status and trends, values and benefits, existing and future risks and pressures) and use that knowledge to protect, grow and maintain the existing and future urban ngahere. The strategy identified 18 high level actions to achieve strategy outcomes (see attachment 1) and recognised that collaboration, funding and partnerships are all fundamental to successful implementation.
5. At the time of approval of the strategy staff had mainly anecdotal evidence on the status and trends of Auckland's urban ngahere. Staff informed committee members that six key actions have been identified to increase our knowledge of Auckland's urban ngahere and made specific reference to the 2016-2017 LiDAR (Light Detection and Ranging) survey that is expected to enable identification of trends in urban forest canopy cover across the region between 2013 and 2016-2017.
6. Environment and Community Committee members resolved to request staff to report back to the Committee on the results of the LiDAR survey and an implementation plan for the strategy, which will include additional work on costs and benefits and funding sources, in August 2018, or earlier if possible subject to availability of LiDAR data.

Planning Committee meeting of 3 April 2018

7. Staff provided a report on the current and future regulatory and non-regulatory techniques of urban tree protection to the Planning Committee meeting on 3 April 2018.
8. Staff did not recommend any changes or additions to the current regulatory regime for tree protection and instead recommended that the status quo remain. This was principally because several initiatives are already underway to protect trees (and other vegetation) in the urban areas. Specific reference was made to:
 - the recently approved Strategy for Auckland's Urban Ngahere (which includes seven high level actions to better protect the existing and future urban ngahere); and
 - the Unitary Plan Monitoring project which will develop indicators and measures for determining the efficacy and efficiency of regulatory tools (including those related to tree protection).
9. At this meeting Planning Committee members resolved to:
 - endorse council's current approach to managing and protecting trees in Auckland taking into account the adoption of the Strategy for Auckland's Urban Ngahere in February 2018;
 - request staff to initiate a discussion with Government in relation to options for the management, protection and restoration of trees and vegetation in Auckland and across New Zealand;
 - receive a further report to the Environment and Community Committee, with updated LiDAR and resource consents data, as part of reporting on the Strategy for Auckland's Urban Ngahere by August 2018.

Update on workstreams related to trees in urban areas

10. Further to the 20 February 2018 Environment and Community Committee meeting and the 3 April 2018 Planning Committee meeting, and considering the implementation framework included in the Strategy for Auckland's Urban Ngahere, an update is provided on:
 - finalising the Strategy for Auckland's Urban Ngahere for public release;
 - area-specific implementation and funding opportunities;
 - the status and initial results of the 2016/2017 LiDAR survey;
 - further analysis of resource consent data related to tree removal;
 - initial discussions with Government in relation to options for the management, protection and restoration of trees and vegetation in Auckland and across New Zealand.
11. The updates cover several, but not all the 18 high level implementation actions identified in the strategy. They can be seen as an early progress report on implementing some of the actions identified in the strategy.

Discussion

Workstream 1: Finalising the Strategy for Auckland's Urban Ngahere for public release

12. Finalising the draft strategy for public release is on-going. Progress has included the writing of a mihi and foreword, professional proof-reading of the draft text, translation of headings to te reo Māori and sourcing of images). Further design and layout work is required before the strategy can be presented to the Chair, Deputy Chair and IMSB member for approval in preparation for public release.
13. The Chief Sustainability Office and Natural Environment Strategy Unit are working with the Communication and Engagement Department and the Design Studio to finalise the strategy and prepare a communications plan for public release.
14. It is expected that the strategy will be presented to the Chair, Deputy Chair and IMSB member for their approval in September 2018.

Workstream 2: Area-specific implementation and funding opportunities

15. The strategy identifies the need for an area specific approach to implementation that requires engagement with local boards and key partners and stakeholders to discuss individual needs and drivers for growing and protecting Auckland's urban ngahere.
16. Community Services staff explored the opportunity to prepare more detailed implementation plans in collaboration with local boards through the Locally-Driven Initiative (LDI) funding.
17. The following 13 local boards have agreed to fund a project that will support area-specific implementation of the urban forest strategy: Albert-Eden, Henderson-Massey, Hibiscus and Bays, Howick, Kaipātiki, Māngere-Ōtāhuhu, Maungakiekie-Tāmaki, Ōrākei, Ōtara-Papatoetoe, Puketāpapa, Upper Harbour, Waitemātā and Whau.
18. Scoping of these area-specific projects is currently underway with delivery of project results expected in the 2018-2019 financial year. Identification of further funding sources and additional work on cost-benefit analysis is anticipated to be part of area specific implementation.
19. In addition to seeking local board funding, staff have also started exploring opportunities to achieve strategy outcomes through planning processes for urban development (e.g. structure planning, place-based spatial planning and Supporting Growth), application of strategic principles to existing programmes (e.g. million trees programme) and inclusion of strategy outcomes in urban design manuals (e.g. Roads and Streets Framework).

Workstream 3: Status and initial results of the 2016-2017 LiDAR survey

20. The focus of this workstream is to use 2016-2017 LiDAR data to do region-wide urban forest canopy cover analyses. This will help to understand the status and trends in urban forest canopy cover between 2013 and 2016-2017. These results will guide and assist with the implementation of the urban forest strategy.
21. There has been a significant delay in the delivery of the 2016-2017 LiDAR data, but these data will be of higher quality compared to previous surveys. The new LiDAR data for the southern areas (south of the Mangere Inlet) has recently (July 2018) become available and the full dataset covering the entire region is expected to become available around September 2018.
22. Once these (large) datasets have been received quality control checks and analyses will be done to deliver:
 - region-wide canopy cover status and trends analyses;
 - status and trends analyses at local board scale to support area-specific implementation of the strategy (see workstream 2).
23. A preliminary assessment of 2016-2017 LiDAR data is presented in attachment 2. Within the southern half of the Auckland region, six representative suburbs were selected to assess the urban canopy cover change (Mellon's Bay, Howick, Mangere Bridge, Mangere East, Flat Bush and East Tamaki Heights).

24. This preliminary analysis detected a 1% net increase in canopy cover across the six areas over the three-year period from 2013 to 2016. There were also significant losses of urban canopy cover in each area, but in all but one suburb (East Tamaki Heights) these losses were counter-balanced by the gains.

Workstream 4: Further analysis of resource consent data

25. As conveyed to the Planning Committee in April this year, there are challenges in extracting quantitative consent data from the NewCore / SAP platform. Following discussion with the Resource Consents department, Plans & Places has initiated a process outside of the SAP platform to collect and analyse consents data.
26. A trial of this process was undertaken, and the formal capture and analysis of the data commenced in early July 2018. The data will provide a granular breakdown of resource consent decisions against the rules of the Auckland Unitary Plan that they have triggered. Further, it will also provide a spatial aspect to consent activity. This information will be utilised in a number of ways, in particular to inform the monitoring of the Auckland Unitary Plan.
27. The new collected data will provide more accurate quantitative data for tree and vegetation removal, for example where vegetation alteration rules are triggered within wider land use consents for other activities.
28. As the process has only recently started, there is little data available as yet. It will take some time to collect, record and analyse the necessary information, and this will steadily become available as the project progresses.
29. Future work will focus on assessing the effectiveness of tree protection tools in the Auckland Unitary Plan through the Unitary Plan Monitoring project. Details of this project will be presented to the Planning Committee in September 2018.

Workstream 5: Initial discussions with central government on options for the management, protection and restoration of trees and vegetation in Auckland and across New Zealand

30. An initial discussion was held with the Ministry for the Environment (MfE) in May 2018. One of the workstreams currently underway in MfE's 'Urban Growth Pillar' is focusing on urban development outcomes, including the role that urban trees play in a 'quality-built environment'. There is an opportunity for council to have a role in these discussions.
31. On-going liaison with central government was identified as one of the high-level actions in the draft Strategy for Auckland's Urban Ngahere. This is anticipated to be a long-term process and the outcomes of these discussions are best reported back as part of implementation of the strategy.

Next steps

32. The 18 high level actions included in the Strategy for Auckland's Urban Ngahere (see attachment 1) will guide and direct future work relating to trees (and other vegetation) in Auckland's existing and future urban areas.
33. The five workstreams described above give effect to several, but not all of the 18 high level actions. Staff will present a progress report on implementing the strategy covering all 18 high level actions to the Environment and Community Committee in August 2019.
34. Staff will present an update on the Auckland Unitary Plan Monitoring project to the Planning Committee in September 2018.

Attachment 1 High level actions identified in the Strategy for Auckland's Urban Ngahere

The Engage and Manage mechanisms identified in the strategy framework run through all the high level actions and are central to their successful implementation.

Knowing			
<i>High level actions to support the following outcomes:</i>			
<ul style="list-style-type: none"> • better understanding of the status and trends on private and public land over time • better understanding of the diverse values and benefits of Auckland's urban forest • better understanding of existing and future risks and pressures 			
High level actions	Implementation timeframe (years)		
	1-2	3-5	Ongoing
1	Incorporate three-yearly LiDAR surveys in council work programmes.		✓
2	Create database for existing assets within two years.	✓	
3	Integrate scientific knowledge of the urban ngahere with mātauranga Māori in partnership with mana whenua of the urban ngahere.		✓
4	Quantify values and benefits (within 12-18 months).	✓	
5	Determine survival rates of new council plantings.		✓
6	Identify key pressures and risks in partnership with mana whenua and local boards.	✓	

Growing			
<i>High level actions to support the following outcomes:</i>			
<ul style="list-style-type: none"> • increase the average canopy cover to 30 per cent across Auckland's urban area with no local board area having less than 15 per cent canopy cover • increased resilience to existing and future pressures 			
High level actions	Implementation timeframe (years)		
	1-2	3-5	Ongoing
1	Increase canopy cover in road corridors, parks and open spaces to support an average of 30 per cent canopy cover across Auckland's urban area with no local board area having less than 15 per cent canopy cover.		✓
2	Identify and prioritise locations for future planting on public land in partnership with mana whenua and local boards.	✓	
3	Use science and ongoing engagement with local boards, mana whenua and communities to inform decisions in relation to types of planting.		✓
4	Increase the capacity of nursery programmes (including maraes) to increase the supply of eco-sourced plants.		✓
5	Leverage partnerships established through existing initiatives (e.g. the Mayor's Million Trees programme).	✓	

Protecting				
<i>High level actions to support the following outcomes:</i>				
<ul style="list-style-type: none"> • no net loss of canopy cover at the scale of local board areas • no loss of percentage of trees larger than 10 metres • no net loss of notable trees 				
High level actions		Implementation timeframe (years)		
		1-2	3-5	Ongoing
1	Complete a comprehensive review of tree protection under the Auckland Unitary Plan Operative in part.	✓		
2	Explore potential for new regulatory tools to protect trees on private properties (e.g. working with central government).	✓		
3	Increase landowner grants and incentive programmes (e.g. heritage tree fund for private property owners).			✓
4	Address current and future pressures to Auckland's urban ngahere and protection.			✓
5	Raise public awareness of the values and benefits of the urban ngahere (e.g. status and trends, pressures, planting guidelines, proper tree care).			✓
6	Raise arboriculture maintenance programme from two to five years or until new plantings are well established (a target survival rate of 70-80 per cent).	✓		
7	Establish a labelling programme for protected trees within 12 months (e.g. species, age and benefits).	✓		

Attachment 2 Preliminary assessment of urban forest canopy cover between 2013 and 2016-2017 using LiDAR data

Methods

Within the southern half of the Auckland region, six representative suburbs (Mellon's Bay, Howick, Mangere Bridge, Mangere East, Flat Bush and East Tamaki Heights) were selected to assess the change in canopy cover of urban forest. These areas combined made up approximately 8% of the southern urban area. Suburbs were chosen to reflect a cross section in demography and baseline canopy cover ranging from low (~10% cover of urban forest canopy 3m+ in height in this suburb) to high (>25% canopy cover). The sample also contained two suburbs on the margins of the metropolitan area that are currently under-going significant change from rural to urban land-use: Flat Bush and East Tamaki Heights.

A common method for measuring urban canopy coverage is using LiDAR. The primary use of LiDAR for Auckland Council has been the generation of terrain models for stormwater modelling. We are able to utilise the above ground LiDAR measurements for extraction and measurement of vegetation. By using the LiDAR flown in 2013 and 2016 we are able to assess vegetation distribution and height. This is not the only method available for measuring vegetation distribution. Other methods include high resolution satellite imagery classification and aerial imagery analysis, although LiDAR has the added benefit of both horizontal and vertical (height) measurements.

By using the pre-classified vegetation point cloud data for each 2013 and 2016 LiDAR flyover, we were able to create two respective canopy height models and compare them against each other to detect change. Change was assessed in each of the representative suburbs and broken down into tree height classes. An example of the type of data used to make these comparisons is presented in Figure 1. The red pixels show locations where tree canopy has been lost – usually through the loss of a discrete tree or group of trees.

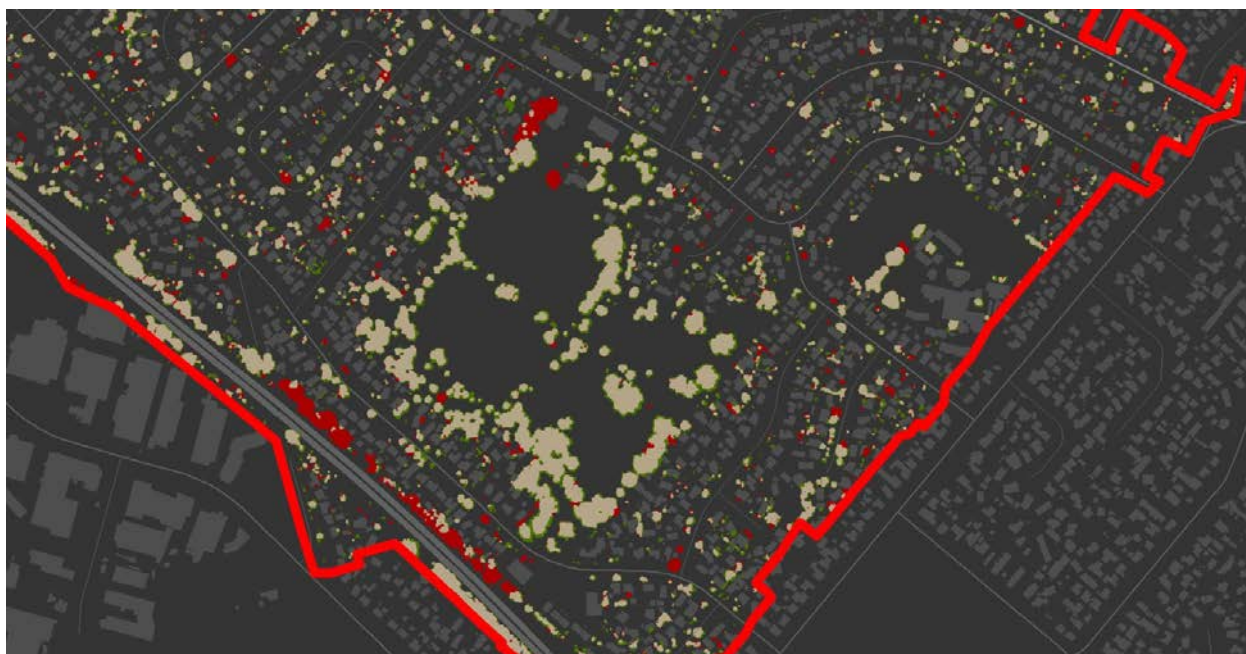


Figure 1: Snapshot of spatial data depicting the change in tree canopy cover between 2013 and 2016 LiDAR data. Red pixels show canopy loss, green pixels are canopy gain, and beige pixels show persistent canopy over the approximately three-year period between the two samples.

Results

The results are to be treated as indicative only, as they have not yet been verified in detail.

This preliminary study detected a 1% net increase in urban forest canopy cover - across all six suburbs that we examined - over the three-year period from 2013 to 2016 (Table 1). Five out of the six representative suburbs (Mellon's Bay, Howick, Mangere Bridge, Mangere East and Flat Bush) showed a net gain in urban tree canopy cover (Table 1). East Tamaki Heights experienced a net loss (-4%) of urban tree canopy of the three-year period. This was largely the result of a single clearance event of large trees (20-30m in height) where exotic plantation forest in the rural fringe of the suburb was cleared and replaced by housing.

Table 1: The percentage cover of urban forest in 2013 and 2016 for a sub-sample of six suburbs from the south-eastern part of Auckland city.

Suburb	Year		% change
	2013	2016	
Mellons Bay	23%	24%	+ 1%
Howick	16%	17%	+ 1%
Mangere Bridge	11%	12%	+ 1%
Mangere East	10%	11%	+ 1%
Flat Bush	19%	20%	+ 1%
East Tamaki Heights	39%	35%	- 4%
TOTAL for all six suburbs	18%	19%	+ 1%

The overall net increase in canopy cover disguised significant change in urban forest cover. The data shows there were significant losses of urban canopy cover in each suburb, although in all but one suburb (East Tamaki Heights) these losses were counter-balanced by the gains (Table 2). These suburbs are effectively in a dynamic equilibrium between canopy cover loss from tree removal and development, and canopy gains from tree canopy growth and new tree plantings. The two different types of canopy cover gain are clearly evident in Figure 1. The green 'donuts' show marginal growth of established trees, whereas the green 'dots' show where the canopy of a newly planted tree has grown above the 3m threshold for inclusion as part of the urban forest.

The greatest gains in urban forest canopy were experienced in Mangere East and Mangere Bridge (12% and 13% respectively). However, the low 'starting point' in terms of total urban forest cover in these two suburbs meant these relatively large increases in cover only translated to a just over one percentage point gain in overall canopy cover (Table 1).

Table 2: Gains and losses of urban forest canopy between 2013 and 2016 in a sub-sample of six suburbs from the south-eastern part of Auckland city.

	% loss of 2013 tree canopy cover from 2013 to 2016	% gain in new canopy cover (based on 2013 area) from 2013 to 2016
Mellons Bay	20%	24%
Howick	24%	30%
Mangere Bridge	16%	29%
Mangere East	22%	34%
Flat Bush	14%	15%
East Tamaki Heights	19%	9%
TOTAL for all six suburbs	17%	18%

There has been a disproportional loss of tall urban forest canopy cover between 2013 and 2016. The loss of tree canopy cover in the larger height classes (i.e. taller trees) was clearly evident across all six suburbs (Figure 2). With only one exception (15 – 20m height class in Mangere East) net tree canopy 10m+ in height decreased across all six suburbs and net growth in tree canopy cover was confined to the two lower height classes. Flat Bush and East Tamaki Heights in particular were characterised by significant losses of large trees in the rural portions of these suburbs as these areas were cleared to provide ‘clean’ sites for new development.

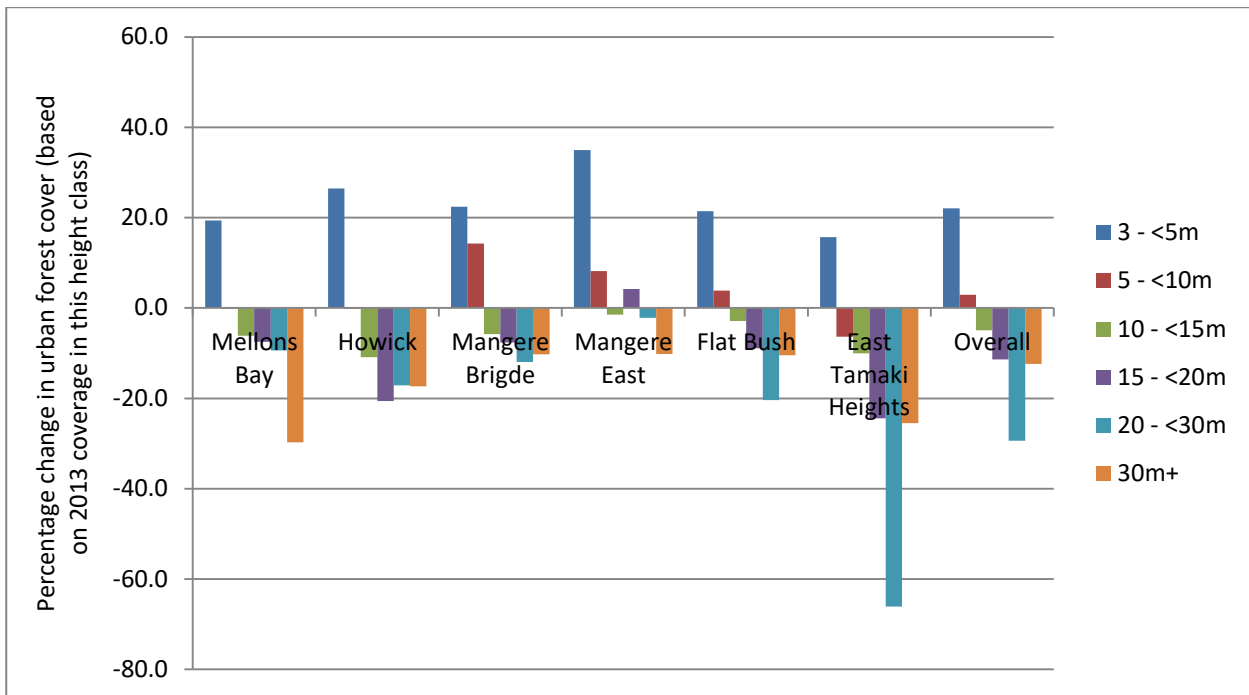


Figure 2: Percentage change (gains and losses) of urban forest canopy in different height classes between 2013 and 2016. Data from a sub-sample of six south-eastern suburbs of Auckland city.