

SECTION 3: APPENDIX

3.01 APPENDIX 1 - BACKGROUND REPORT LIST

WA code	Document name	Date created	Created by	Source	Notes
A	Wellington Town Belt Management Plan	Aug-13	WCC	WCC	
B	Wellington Town Belt Vegetation - Implementation Plan 2000 - 2020	Dec-00	Boffa Miskell	WCC	
C	Mount Victoria Redevelopment - Design Concept	Sep-04	Boffa Miskell	WCC	
D	Wellington City Resident's Usage of & Attitudes Towards the Town Belt	Oct-04	A.Hastings & N.Newman	Online	
E	Manaaki Te Keo - Bringing birdsong back to Mt Vic	Aug-14	S.Farrant	WCC	
F	City to Summit - Mt Victoria Enhancement Planting Project	Jul-12	S.McCahon, Rotary Club, WCC	WCC	
G	The Mt Vic Revegers Memorandum of Understanding	none	WCC & Wellington Orienteering Club	Email	
H	Wellington Mountain Bike Club MOCL	none	WCC & WMTNBC		
I	Makara Peak Way-Finding Signage	none	WCC & Massey University Students	Email	
J	Guidelines for Artwork for WCC Pictograms	none	WCC & Concept - Sign & Display	Email	
K	Wellington Town Belt Stand Stability & Risk Assessment	2005-2006	Kevin Reardon WCC	WCC	
L	Wellington Town Belt Management Plan - Background Report 1 Ecology	1992	WCC & Boffa Miskell		
M	Wellington Ecodomain Delineation	none	WCC & Boffa Miskell		
N	Wellington's Living Cloak - A Guide to the Natural Plant Communities	1993	Isobel Gabites	WA Library	
O	NZS 1170.5:2004 site subsoil classification of Wellington City	2011	AECOM & GNS Science	Email	
P	A Botanical Survey of the Indigenous Forest Remnants in Wellington Botanic Garden, Glenmore Street, Wellington	2005	B.J. Mitcalfe & J.C.Horne		
Q	Wellington Regional Native Plant Guide	2010	WRC	Online	
R	Green Toolbox - Wellington and Sounds Region Plant Species List	2014	Green Toolbox, LCR	Online	
S	Memorandum of Understanding between WCC and Wellington Orienteering Club		WCC & Wellington Orienteering Club	Email	
T	Memorandum of Understanding between WCC and the Rotary Club		WCC & ROTARY CLUB	Email	
U	Dry Creek Replacement Cleanfill, SH 58, Porirua - Assessment of Terrestrial Ecological Effects	Nov-12	Boffa Miskell	Email	

3.02 APPENDIX 2 - STAKEHOLDER ENGAGEMENT REPORT

Introduction

The first stage of consultation was to establish how people use Mt Victoria, where they go and what they like. Key user groups were contacted and project team members met with individuals and groups. Appendix 2 Stakeholder Engagement Plan outlines the process and provides a record of engagement.

The open day on Saturday the 11 October was attended by approximately 25-40 people. Many completed a comment form (Appendix 3) or emailed comments following the open day.

Everyone who talked to the project team values Mt Victoria/Matairangi highly and regards it as the City's premier park. They have differing views on some aspects but all seek to improve this valuable asset.

Key Themes

Comments were wide ranging and varied on both vegetation management and recreational use. There were recurring themes however that people had views on.

These were:

- Relationship between walkers (with or without dogs) and mountain bikers
- Pine retention or removal
- Native regeneration
- Dogs
- Signage

Comments on these topics are summarised below:

Vegetation management

- Pines provide recreational opportunities such as orienteering, as they have clear spaces underneath allowing openness and views
- The pines should be removed with native regeneration to replace
- Better co-ordination between the various individuals and groups who undertake revegetation is required
- Better weed control is required particularly removal of Tradescantia
- Revegetation should be aiming to make Mt Victoria part of the regional ecological corridor
- Create small spaces of seating and tables protected from the wind using native planting
- Use natural fertilisers rather than chemicals
- Gentle terracing and leaving broken branches to rot naturally assists the soil system and encourages biodiversity
- Create bee corridors

Recreation: Track management

- Mountain bikers are dangerous and conflict with walkers. The alternative view is that there are no conflicts and bike riders are considerate. Conflict occurs where walking tracks intersect with bike tracks
- Bikers conflict with dogs not under control
- Signage is inadequate, confusing and people get lost
- Better signage is needed at intersections
- Signage telling people how to get to Mt Victoria needs to be improved
- Signage should include information on the steepness of tracks
- Signage indicating that revegetation is being undertaken and perhaps roping off these areas would assist with replanting efforts
- Tracks are not well maintained, are boggy in winter and get eroded through steps and bikers
- A clearer route for tourists to the top is required

- The mountain bike tracks are world class
- Need more options for walking dogs off lead, routes that link dog exercise areas
- Need more easy grade tracks, commuting and for kids biking
- Mountain bikers have made own tracks which can be confusing
- Separated trails for different levels of competency for bikers would be good
- There is a dangerous bike track exit at SPCA where it crosses Alexandra Road
- There is no connection between the upper football pitch and the southern walkway but there is scope for this

Recreation: Spaces

- The wildness of the area is valued and should be maintained
- Views to city and sea need to be maintained
- Open areas are good for socialising
- Rubbish disposal is generally a problem but it is particularly bad at Charles Plimmer Park where people go to picnic and drink, they leave bottles and rubbish
- Charles Plimmer Park is well used but as it is a dog walking area this use conflicts with others not with dogs especially children
- The provision of seats is good but don't want too many
- Something for young people would be good such as a children's garden
- As there are dog specific areas dog free areas are necessary
- The rope swing/s are liked
- More activities are sought such as an adventure playground
- Interpretation would enhance the experience and quality of the area. This could include information on the history of the area and specific events, planting, planting groups
- A Disaster Recovery Plan for the area would guide Council in what action to take after an event
- A Civil Defence central location is required so people caught in an event know where to go
- There is no clear main entrance and this needs to be identified and signposted accordingly
- Pirie St play area is good and well used but there are problems with rubbish, boy racers, overnight campers in the carpark
- Mt Victoria provides a good range of opportunities for orienteering
- The Master Plan needs to manage and guide the different groups
- There shouldn't be any more structures
- The community garden brings the community together

3.03 APPENDIX 3 - VEGETATION RISK METHODOLOGY

VEGETATION RISK METHODOLOGY

Stand Stability and Risk Assessment model.

The model consists of 14 tree and site assessment criteria which when measured will reflect

1. The likelihood of tree/stand failure and
2. The risk potential should tree/stand failure occur.

It is designed to compare the various exotic vegetation compartments that comprise each management area within the Town Belt against each other in terms of risk and likelihood of failure. From this assessment a priority list for tree removals can be formulated. In most instances the criteria are measurable and hard data produced to eliminate any bias or inconsistencies in determining priority tree removal areas. Tree measurements were conducted on a simple random sampling basis at a 2% sampling intensity.

Measuring Stand Stability

10 criteria have been used, which, when measured will reflect individual tree stability.

These are;

Tree Species - Different species are prone to decay, toppling and/or breakage to different degrees. Radiata Pine and Macrocarpa are more prone to tree and stand failure (wind throw) whereas the more open canopy of Eucalypts results in more branch breakages.

Age - Tree failure increases with a trees age, size and maturity. Tree age has been estimated using growth ring counts from an increment borer and historical records (Town Belt Management Plan background reports).

Average Tree Size - Measured as diameter at breast height (DBH) Tree failure increases with a trees age, size and maturity. A larger diameter tree has the potential to cause more damage should failure occur.

Average Tree Height - Measured in metres. Tree height will help determine the treefall distance and risk to nearby targets.

Tree Lean - Number count. The number of trees toppled but not completely blown over will give an indication of stand stability. Calculated on a per hectare basis.

Previous Failure - Number count. General assessments of any previous wind throw and snapped stems will reflect stand stability. Calculated on a per hectare basis.

Structural faults - Number count. Generally assessing the numbers of trees that show physical faults indicative of tree/stand failure e.g. root plate lifting, branch tearing, dead standing trees. Calculated on a per hectare basis.

Stocking - Measured as average Stems per Hectare (SPH) - In general, higher density stands are more prone to windthrow.

Aspect - Trees on certain aspects are more prone to toppling from storm events. Easterly and southerly wind conditions usually bring rain and saturated soil conditions on slopes that face this direction. This combined with medium to high wind conditions increases the likelihood of windthrow on these slopes e.g. Tinakori Hill. These shaded and more sheltered slopes usually have larger and taller trees and are also most favourable for regeneration of native podocarp forests.

Northerly and Westerly winds although more predominant are generally dry with less rainfall. Trees on these aspects are more conditioned from winds from these directions and with drier ground conditions, more stable in storm events.

Wind Zones - have already been identified throughout the city and classified as very high, high, medium or low.

As most of the small woodlots on the Town Belt are of an even age, individual tree stability indicators will reflect on the stand/compartments stability as a whole.

Assessing Risk

Four criteria have been assessed which will reflect the risk potential should tree failure occur. These are;

Target status - The consequences of Town Belt trees failing onto residential or commercial properties are greater than that of trees which fail onto open spaces or sports fields.

Frequency - Each target has been assigned a high, medium or low frequency of use based on anecdotal evidence. Residential houses have been assessed as being high frequency, while sports fields and most walking tracks judged to have a low frequency of use.

Relative elevation - The location of the trees in relation to the target. A tree above a potential target and within fall distance constitutes a greater risk than a tree below a potential target outside the fall distance. Where there is more than one target the relative elevation is taken in relation to the most significant target.

Slope - Measured by slope angle of terrain. Trees on steeper slopes pose a greater risk to targets should they topple or break up than those on flat to easy sloping terrain. Steeper slopes are also characterised by a thinner soil layer.

Because of the senescent nature of many of the tall exotic trees on the town belt, these factors affecting tree and stand stability will become more influential over time.

Ranking

Each criteria are ranked on a scale of 1 - 4. The parameters set for 1 reflect a low likelihood of stand/tree failure and a low level of risk. The parameters for 4 being those trees, stand and site indicators which reflect an increased likelihood of wind throw and constitute a greater level of risk to people property or infrastructure*.

A compartment scoring 24 or above in the Stand Stability Assessment is deemed to have a High likelihood of failure as the trees are more likely to fail during storm events based on the criteria parameters. A compartment scoring 23 or less is deemed to have a Low likelihood of failure based on the criteria parameters.

A compartment scoring 14 or above in the Risk Assessment is deemed a High risk to people, property or infrastructure based on the criteria parameters. Because there may be more than one target in or around many of these compartments and to reflect the higher risk potential, the target status criteria carries a maximum score of 10 (4+3+2+1). Multiple, high frequency targets will generally warrant a high risk assessment.

* based on anecdotal evidence, background investigation, previous Town Belt hazardous tree reports.

By adding the stand stability score and risk assessment score together a total score is attained

Stand Stability Assessment

Assessment Criteria	4 (high)	3	2	1 (low)
Tree species	Conifers/Macs	Eucalyptus	Pohutakawas	Broadleaf's
Age	>80	70-79	60-69	<59
Avg. Tree size (dbh)	> 60	50-59	40-49	<39
Avg. Tree height (m)	>30	25-29	20-24	<19
Tree lean (per ha)	>10	5-9	1-4	0
Previous failure (per ha)	>10	5-9	1-4	0
Structural faults (per ha)	>20	15-19	10-14	<9
Stocking (sph)	>800	700-799	600-699	<599
Aspect	East, South	West	North	Sheltered
Wind zone	V. High, High	Medium	Low	Sheltered
Score	24-40 / 10-23			
Likelihood of Failure	HIGH / LOW			

Risk Assessment

Criteria	4 (high)			3			2			1 (low)		
Target status	Property (houses, commercial)			Infrastructure (roads, reservoirs, powerlines)			Walk tracks			Open fields (sports fields, parks)		
Frequency	High -75	Medium -50	Low -25	High -75	Medium -50	Low -25	High -75	Medium -50	Low -25	High -75	Medium -50	Low -25
Relative elevation	Above & <30m			Parallel & <30m Above >30m			Below & <30m			Below & >30m		
Slope (°)	>20°			15°-19°			10°-14°			<9°		
Score	14-21 / 3.25-13											
Risk Level	HIGH / LOW											

Total Score	/ 61
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Priority Removal and Management plan

At the completion of the assessments each compartment will fall into one of four categories depending on its individual score. Either;

High Risk and High Likelihood of failure (HRHL), High Risk and Low Likelihood of failure (HRLL), Low Risk and High Likelihood of failure (LRHL), Low Risk and Low Likelihood of failure (LRLL)

These Risk and Likelihood categories will formulate the basis of the Priority Removal