

# Flora and vegetation of the Thomas Grace Scenic Reserve, Woodhill, NW Auckland

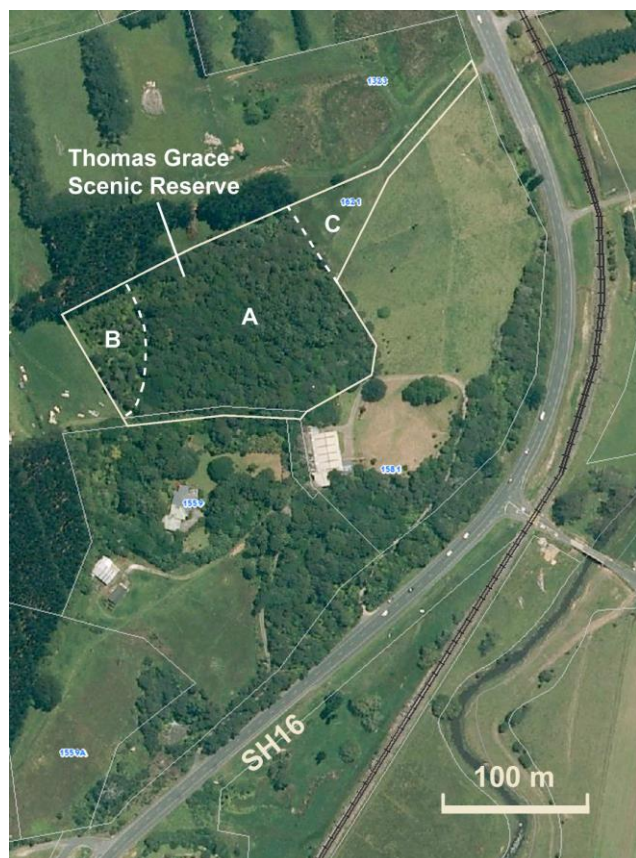
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## Introduction

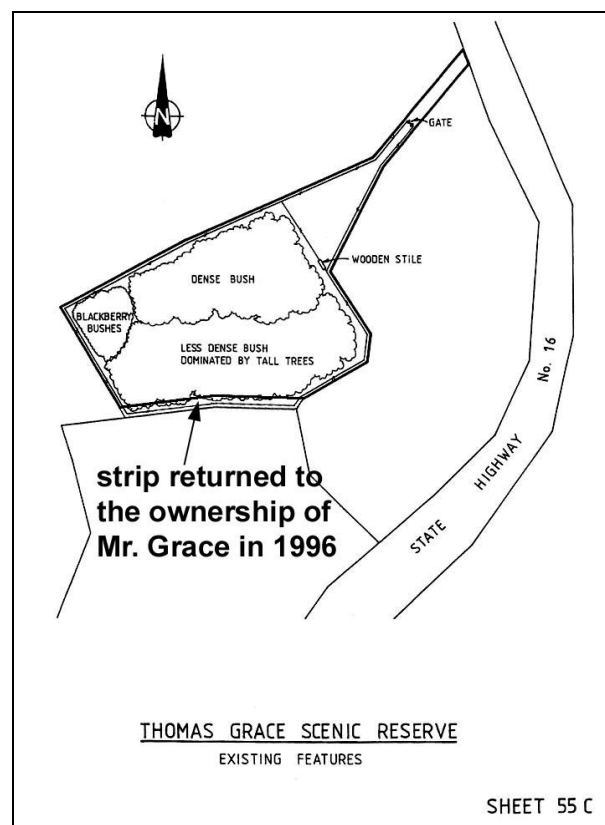
Thomas Grace Scenic Reserve (2.37 ha), is situated just north of Woodhill School on the western side of State Highway 16, northwest Auckland, 36° 44' 24" S, 174° 26' 26" E, 20-40 m asl (Fig. 1). It is a stunning tall podocarp-kauri (*Agathis australis*) forest in an advanced state of regeneration. Since the 1920s, Doug Guy had owned the farm property, which included the present forested reserve land. In the early 1970s when Thomas Grace purchased the property, Guy informed him how he loved the native bush on the property. After a while Grace became concerned about the long-term protection of the bush and, following a suggestion from a colleague, in 1972 he donated the bush area to Waitemata County Council, which included an access strip from SH 16 (Fig. 2). In the following year the forest was gazetted as the Thomas Grace Scenic Reserve. In 1996 a strip along the southern boundary was returned to the ownership of Mr. Grace. Today the bush is managed by Auckland Council. Grace still owns the land that surrounds the bush.

Shortly after seeing the bush on an Auckland Conservation Board field trip, EKC led an Auckland Botanical Society (ABS) trip to Thomas Grace Scenic Reserve on the morning of 19 March 1994, at that time managed by Rodney District Council (the afternoon was spent in the nearby Hodges Basin at Woodhill). The species list generated from the visit was supplied to Rodney District Council, which was grateful for it for their Management Plan preparation.

Then, 22 years later, EKC and PJB visited the Thomas Grace Reserve on 7 August 2016, spending nearly three hours there recording its vascular flora (Fig. 3). The local geology is Quaternary sandstone (B.W. Hayward pers. comm.), i.e. it is a consolidated stabilised dune at the eastern end of the sequence of active dunes to the west. The bush is in the southern part of a NE-facing amphitheatre. A northern aspect is unusual for small bush reserves; southern aspects are more frequent (pers. obs.). The bush is surrounded by kikuyu (*Cenchrus clandestinus*) pasture on east and west sides, a narrow pine plantation on the northern side, and native



**Fig. 1.** Location of Thomas Grace Scenic Reserve, Woodhill, NE Auckland. Auckland Council GIS Viewer (adapted by Joshua Salter).



**Fig. 2.** Plan of Thomas Grace Scenic Reserve, presumably drawn when the reserve was created in 1972-73. Note – blackberries on the western side had gone by 1994. Plan supplied to EKC by Rodney District Council in 1994; modified by J Salter to reflect the 1996 change.



**Fig. 3.** View of the Thomas Grace Scenic Reserve from the entrance by SH 16. All photos by EKC, 7 Aug 2016.



**Fig. 4.** Tall canopy of kauri and podocarps viewed from the access way.

broadleaf forest on the south side. The reserve bush drains to the NE and there is swampy land in the NE corner of the forest, draining further to the NE where there is open standing water along the northern margin of the legal access strip. Mr Grace has developed native wetlands on his flat land to the north of this access way.

The forest reserve is part of a Significant Ecological Area (SEA) in the Proposed Auckland Unitary Plan. The SEA includes forest to the south, providing a 600 m long chain of virtually unbroken native forest canopy nearly reaching the

Woodhill School. The forest is within the Kaipara Ecological District.

### Vegetation

We have divided the reserve into three vegetation types (Fig. 1), which generally follows the Auckland Council Ecological Survey Rapid Assessment of the area by Jamie MacKay in April 2014 (held by Auckland Council).

#### A. Tall forest

This advanced regenerating stand of tall emergent kauri and podocarps (Fig. 4), has a lower subcanopy of broadleaf species. The tall kauri are yet to develop heavy crowns. The dominant canopy species are: kauri, kahikatea (*Dacrycarpus dacrydioides*) and tōtara (*Podocarpus totara*). Mātai (*Prumnopitys taxifolia*), rimu (*Dacrydium cupressinum*) and tānekaha (*Phyllocladus trichomanoides*) are more locally present. The tallest kauri reach an estimated 40 m tall, with a dbh of 80 cm (Fig. 5). In order of decreasing abundance the broadleaf subcanopy consists of: kohekohe (*Dysoxylum spectabile*), karaka (*Corynocarpus laevigatus*), pūriri (*Vitex lucens*), māhoe (*Melicytus ramiflorus*), tītoki (*Alectryon excelsus*), pigeonwood (*Hedycarya arborea*); tawa (*Beilschmiedia tawa*) and single trees of pukatea (*Laurelia novae-zelandiae*), rewarewa (*Knightia excelsa*) and māmāngi (*Coprosma arborea*). The largest tītoki we estimated to be 25 m tall. Sand kānuka (*Kunzea amathicola*) was mainly on the forest edge. Taraire (*Beilschmiedia tarairi*) is still only represented by seedlings. Nīkau (*Rhopalostylis sapida*) and kohekohe dominate the understorey (Fig. 6) and their seedlings are also abundant. *Astelia hastata* and leather-leaf fern (*Pyrrhosia eleagnifolia*) were the only frequent epiphytes. Thread fern (*Blechnum filiforme*) was a common climber. Large kōhia vines (*Passiflora tetrandra*) were also common (Fig. 7). Other woody climbers included *Parsonsia ?heterophylla*, two climbing rātā species (*Metrosideros perforata* and *M. fulgens*, both quite youthful) and *Muehlenbeckia australis*.



**Fig. 5.** Peter Bellingham with tall kauri, Thomas Grace SR.

The forest in the damp floodplain area towards the NE corner is of different composition. The canopy is dominated by kahikatea. The single pukatea occurs here. Mamaku (*Cyathea medullaris*) were restricted to this area, represented by five dead-standing trunks to 7 m tall and two young living plants. The dead tree ferns were most likely a casualty of the Auckland drought of Jan-Mar 2013. Also present in this damp area were *Gahnia xanthocarpa* tussocks, kiokio (*Blechnum minus* and *B. novae-zelandiae*), whekī (*Dicksonia squarrosa*) and several native sedge species.

### **B. Shrubby open forest**

The north western end has some scattered trees but is mainly shrubby, open and weedy, and has developed over abandoned pasture. This area includes a tangle of elaeagnus (*Elaeagnus × reflexa*) in a 4 × 6 m patch among shrubs of karamū (*Coprosma macrocarpa* and hybrids), hangehange (*Geniostoma ligustrifolia*), cabbage tree (*Cordyline australis*), small clumps of kahili ginger (*Hedychium gardnerianum*), creeping buttercup (*Ranunculus repens*), ferns (*Doodia australis* and *Deparia petersenii*), and exotic herbs and grasses. Over the last year the Council has done some weed control within the reserve (Brenda Green pers. comm.). This weeding was evident in this area and there were also very recent small nursery-sourced plantings of: cabbage tree, māhoe, putaputawētā (*Carpodetus serratus*) and kānuka (*Kunzea* sp.). Closer to the western boundary there were also older suspected plantings (pre-1994) including single trees of kōwhai (*Sophora chathamica*), *Hoheria sexstylosa* and tarata (*Pittosporum eugenioides*, 13 m tall, not of Auckland form – wild/planted?).

### **C. The Access strip**

The western end of this strip by the forest was a wet area dominated by native sedges and grasses: *Carex maorica*, *C. virgata*, *Cyperus ustulatus*, *Eleocharis acuta*, *Machaerina articulata*, *M. rubiginosa*, *M. tenax*, *Isachne globosa* and a few exotic grasses. This floodplain association continued for many metres under the forest canopy of kānuka, kahikatea and native shrubs. On the forest margin there were three exotic trees, in fact the only exotic trees in the reserve: weeping golden willow (*Salix × chrysocoma*) in the NE corner of Area A; and two Lombardy poplars (*Populus nigra* 'Italica') on the eastern margin (Fig. 2). Much of the access strip is kikuyu grass with established plantings in part of it including mainly mānuka, 2–3 m tall, with a few cabbage trees and flax (*Phormium tenax*) (Fig. 8).

### **The vascular flora**

Ignoring the suspected six native plantings and two exotic planted species, there are 125 vascular taxa recorded growing wild in the reserve, of which only 18 % are naturalised species (all species recorded are listed in the Appendix). There is a great



**Fig. 6.** Abundant kohekohe and nīkau regeneration, Thomas Grace SR.



**Fig. 7.** Large kōhia vines, like this one on tōtara, reach 10–15 cm diameter.



**Fig. 8.** Established plantings of flax, cabbage trees and mānuka in part of the access strip; looking SW.

representation of native conifers and divaricating shrubs. No nationally or regionally threatened species were present. However, *Carex maorica* which was present in the damp NE forest corner is an uncommon species in the Auckland region despite it being regionally widely distributed. It was rather surprising that no orchids or filmy ferns were recorded.

Comparison of the two surveys (see Appendix) – the two surveys are fairly consistent, considering the time period between the surveys. Small differences include: six 1994 species not seen in 2016. Half of these were *Carex* species that were likely to have been overlooked because they were not fertile in August. The other three were scarce or local, and the single 10 m tall *Phyllocladus* hybrid could easily have been missed if there are now no lower branches. The 27 additions in 2016, which includes 16 exotic species, may have been earlier overlooked because they were all scarce or local, except for five exotics. These more common exotics were blackberry (*Rubus fruticosus*), *Galium palustre*, creeping buttercup, woolly nightshade (*Solanum mauritianum*) and cocksfoot (*Dactylis glomerata*). The first three were in the open in the damp Area C (buttercup also in Area B), woolly nightshade was mainly in Area B, and cocksfoot occurred in most open situations.

Two other weeds present in 1994 have increased their abundance: elaeagnus and monkey apple (*Syzygium smithii*) up to 1 m tall (no adults seen). It would be good to eliminate the seed source (unseen) of the monkey apple, and complete the removal of the elaeagnus, because both are shade-tolerant long-lived species. Note – weed abundances may be influenced by unknown management activities.

### **Fauna**

Mammals – during the ABS visit in 1994 a red deer was in the reserve, presumably an escapee from a nearby deer farm. Cattle hoof prints were present inside the forest by the NE corner in 2016, and an Auckland Council sign read: "Poison laid, 'Pindone' bait targeting possums, rodents and rabbits". Thomas Grace has been maintaining bait stations here for many years (Brenda Osborne pers. comm.).

Birds – seen or heard during our 7 Aug 2016 visit: pūkeko, kererū, silvereye, grey warbler, blackbird, fantail, tūī, chaffinch, goldfinch, starling (?), myna and magpie.

Invertebrates – in 2016 close to the eastern margin but in the forest there was a malaise insect trap in operating condition; the owner was not located.

### **Future management**

Except for part of Area B, weeds are a very minor element of this outstanding indigenous conifer-dominated forest. However, it would benefit from an increase in weed control to make sure this situation does not deteriorate. Continuation of the animal control will also be beneficial. It would be good to remove the three visually prominent exotic trees on the forest margin of the reserve: weeping golden willow and Lombardy poplars. The cattle hoof prints in the damp NE corner of Area A show that the boundary stock fence requires improving. With the ample natural regeneration in the bush there is no need to continue to plant in Area B. If the regeneration is deemed to need assistance, then a better option would be to just shift some of the abundant seedlings (e.g. kohekohe) into the gap at the appropriate time of the year. This will eliminate the chance of any inappropriate plantings. The mānuka plantings in Area C would benefit from increasing their density.

### **Discussion**

This conifer-dominated forest is totally different from the native forest enclaves of Lookout and Hodges Basin Reserves, only 2.3 and 3.2 km respectively to the SW, on the younger sand dunes of Woodhill Forest (cf. Cameron & Bellingham 1986). Here sand kānuka dominates with broadleaf species, but conifers are virtually absent apart from the scarce tōtara or mātai, and to date we have only seen a single mature kauri in all of the Woodhill Forest native areas. The composition of Thomas Grace Scenic Reserve is more comparable to the privately-owned forest 8 km to the south, the Houghton's Bush Camp at the top of Motutara Road at Muriwai that ABS visited in 16 Aug 2003 (led by Fran Hintz, EKC participated). A full comparison could prove interesting.

### **Acknowledgements**

We thank Thomas Grace for his generous gift of the forest and for the history of setting up the reserve (pers. comm. to EKC, Aug 2016); Brenda Osborne at Auckland Council for extracting EKC's 1994 species list from the Council's archives and for recent Council records regarding the reserve; Peter de Lange for confirming the identification of the kānuka species; Bruce Hayward for geological information; and Joshua Salter for assistance with the figures.

### **Reference**

Cameron, E.K.; Bellingham, P.J. 1986: Woodhill State Forest – notes on several natural areas. *Auckland Botanical Society Journal* 41: 46–52.

## Appendix. Vascular flora of the Thomas Grace Scenic Reserve, recorded in 1994 and 2016.

### Key:

a = abundant  
c = common  
lc = locally common  
o = occasional  
l = local

s = scarce (<5 plants seen)  
x = present  
A = adjacent to reserve boundary  
P = planted  
P? = suspected to be planted

V = voucher in AK herbarium  
\* = exotic naturalised species  
\*\* = exotic planted species

SPECIES	1994	2016		
<b>Ferns (23 + 0) (=native + exotic)</b>				
<i>Adiantum hispidulum</i>		s		
<i>Asplenium flaccidum</i>	s	o		
<i>Asplenium lamprophyllum</i>		s, V		
<i>Asplenium oblongifolium</i>	o	l		
<i>Asplenium polyodon</i>	s	o		
<i>Blechnum filiforme</i>	c	c		
<i>Blechnum minus</i>	l	lc, V		
<i>Blechnum novae-zelandiae</i>	o	s, V		
<i>Cyathea dealbata</i>	c	c		
<i>Cyathea medullaris</i>	s	s		
<i>Deparia petersenii</i>	s	l		
<i>Dicksonia squarrosa</i>	s	l		
<i>Diplazium australe</i>		s, V		
<i>Doodia australis</i>	c	o-lc		
<i>Lastreopsis glabella</i>		l		
<i>Microsorium pustulatum</i>	o	s		
<i>Microsorium scandens</i>	lc	lc		
<i>Paesia scaberula</i>		s		
<i>Pellaea rotundifolia</i>	o	s		
<i>Pneumatopteris pennigera</i>	l	s		
<i>Pteridium esculentum</i>	l	lc		
<i>Pteris tremula</i>	o	o		
<i>Pyrrhosia eleagnifolia</i>	c	c		
<b>Conifers (7 + 0)</b>				
<i>Agathis australis</i>	c	lc		
<i>Dacrycarpus dacrydioides</i>	c	c		
<i>Dacrydium cupressinum</i>	s	l		
<i>Phyllocladus toatoa</i> × <i>P. trichomanoides</i>	s, V			
<i>Phyllocladus trichomanoides</i>	o	l		
<i>Podocarpus totara</i>	c	c		
<i>Prumnopitys taxifolia</i>	c	o		
<b>Dicot trees and shrubs (41 + 6)</b>				
<i>Alectryon excelsus</i>	o	o		
<i>Beilschmiedia tarairi</i>	o	o		
<i>Beilschmiedia tawa</i>	c	o		
<i>Carmichaelia australis</i>	o	s		
<i>Carpodetus serratus</i>	l	s & P		
<i>Coprosma arborea</i>	l	s		
<i>Coprosma crassifolia</i>		o	lc	
<i>Coprosma macrocarpa</i>		o	o	
<i>Coprosma macrocarpa</i> × <i>C. robusta</i>		s	s	
<i>Coprosma rhamnoides</i>		c	s	
<i>Coprosma robusta</i>		o	l	
<i>Coprosma spathulata</i>		o	lc	
<i>Coprosma areolata</i>		c	o	
<i>Corynocarpus laevigatus</i>		o	o	
<i>Dysoxylum spectabile</i>		c	c	
<i>Entelea arborescens</i>		s, P		
<i>Fatsia japonica</i> *		s, V	A	
<i>Geniostoma ligustrifolium</i>		o	o	
<i>Hedycarya arborea</i>		o	o	
<i>Hoheria populnea</i>		o	l	
<i>Hoheria sexstylosa</i>		s, P	s, P	
<i>Knightia excelsa</i>		o	s	
<i>Kunzea amathicola</i>		[o]	o	
<i>Kunzea</i> sp.			P	
<i>Laurelia novae-zelandiae</i>		s	s	
<i>Leptospermum scoparium</i>		o & P	l & P	
<i>Leucopogon fasciculatus</i>		s		
<i>Meliccytus micranthus</i>		o	c	
<i>Meliccytus ramiflorus</i>		c	o & P	
<i>Myrsine australis</i>		o	o	
<i>Nestegis lanceolata</i>		s		
<i>Pennantia corymbosa</i>		o, V		
<i>Piper excelsum</i>		o-lc	lc	
<i>Pittosporum eugenoides</i>			s, P?, V	
<i>Pittosporum tenuifolium</i>		s, P		
<i>Populus nigra</i> 'Italica' **			s, P	
<i>Pseudopanax arboreus</i>			s	
<i>Pseudopanax crassifolius</i>			s	
<i>Pseudopanax crassifolius</i> × <i>P. lessonii</i>		s	o	
<i>Pseudopanax lessonii</i>		s	s	
<i>Salix</i> × <i>chrysocoma</i> **			s, P	
<i>Solanum mauritianum</i> *			o	
<i>Sophora chathamica</i>		s, P	s, P?	
<i>Streblus heterophyllus</i>		o	o	
<i>Syzygium smithii</i> *		s	o	
<i>Ulex europaeus</i> *			s	
<i>Vitex lucens</i>		o	o	

Dicot lianas and related trailing plants (7 + 2)			Monocot liana (1 + 0)		
<i>Calystegia sepium</i> subsp. <i>roseata</i>	lc	lc	<i>Ripogonum scandens</i>	c	l
<i>Elaeagnus</i> × <i>reflexa</i> *	s	o, V	Monocot herbs (22 + 6)		
<i>Metrosideros fulgens</i>		s	<i>Astelia hastata</i>	c	o
<i>Metrosideros perforata</i>	o	o	<i>Carex dissita</i>	o	lc
<i>Muehlenbeckia australis</i>	l	o	<i>Carex lambertiana</i>	o	
<i>Parsonsia</i> ? <i>heterophylla</i>	o	o	<i>Carex maorica</i>	l	l, V
<i>Passiflora tetrandra</i>	o	c	<i>Carex secta</i>	s	
<i>Rubus australis</i>	s	s	<i>Carex solandri</i>	o	
<i>Rubus fruticosus</i> agg. *		lc	<i>Carex virgata</i>	l	l
Dicot herbs (5 + 11)			<i>Cenchrus clandestinus</i> *		l
<i>Acaena anserinifolia/novae-zelandiae</i>	l	o	<i>Cyperus ustulatus</i>	l	l
<i>Centella uniflora</i>	l	l	<i>Dactylis glomerata</i> *		lc
<i>Dichondra repens</i>		l	<i>Eleocharis acuta</i>	l	l
<i>Galium aparine</i> *		l	<i>Gahnia lacera</i>	o	o
<i>Galium palustre</i> *		lc	<i>Gahnia xanthocarpa</i>	l	l
<i>Hypocharis radicata</i> *		l	<i>Hedychium gardnerianum</i> *	o	o
<i>Lotus pedunculatus</i> *	lc	o	<i>Isachne globosa</i>	l	la
<i>Myosotis sylvaticata</i> *		s	<i>Isolepis reticularis</i>	l	
<i>Persicaria debilis</i>	l	A	<i>Juncus edgariae</i>		l
<i>Phytolacca octandra</i> *		s	<i>Juncus effusus</i> *	l	l
<i>Plantago lanceolata</i> *		s	<i>Machaerina articulata</i>	lc	lc
<i>Ranunculus repens</i> *		la	<i>Machaerina rubiginosa</i>	x	l
<i>Senecio bipinnatisectus</i> *		s	<i>Machaerina tenax</i>	l, V	s
<i>Solanum nigrum</i> *	s		<i>Microlaena stipoides</i>	o	o
<i>Solanum nodiflorum</i>		l	<i>Oplismenus hirtellus</i>	c	o-la
<i>Sonchus oleraceus</i> *		l	<i>Paspalum urvillei</i> *		l
Tree-like monocots (2 + 0)			<i>Phormium tenax</i>		l? & P
<i>Cordyline australis</i>	o	o & P	<i>Schoenus maschalinus</i>	lc	l
<i>Rhopalostyis sapida</i>	a	a	<i>Typha orientalis</i>		A
			<i>Zantedeschia aethiopica</i> *		l

## ***Arthropteris tenella* hangs in there for 97 years on Maungakiekie (One Tree Hill) in Auckland City**

**Anthony E. Wright**

As a schoolboy, my botanical explorations centred on ferns, with Greta Stevenson's little *A book of ferns* (Stevenson 1954) borrowed rather long term from my school library as my guide. Boy Scout tramps in the Coromandel Ranges, bike rides out to the Waitakeres, and summer holidays in Orewa next to Eaves Bush Reserve (with hitched rides to Waiwera

Hill and Wenderholm reserves) provided access to a fair variety of forest fern habitats. But the bread and butter of my fern explorations were the volcanic cones of Auckland City, and in particular Maungakiekie (One Tree Hill Domain and Cornwall Park). Literally a block away from where we lived in my teens, it was easily available after