Friends of Black Mountain and Friends of the Australian National Botanic Gardens: Overview of outcomes from weeding activities in the Australian National Botanic Gardens, March – July 2013

Friends of Black Mountain Coordinating Group, 11 August 2013

Summary

- Total effort = 163.5 person hours
- Estimated number of woody weeds removed = 1850-2000 plants
- Major woody weed species removed: Sollya (*Billardiera heterophylla*); Cootamundra Wattle (*Acacia baileyana*); Sweet Pittosporum (*Pittsoprum undulatum*); Sydney Golden Wattle (*Acacia longifolia*), Blackwood (*Acacia melanoxylon*), Black Wattle (*Acacia decurrens*) and Howitt's Wattle (*Acacia howittii*)
- Total number of woody taxa removed: 49 species (10 exotic; 39 native to Australia but not indigenous to Black Mountain)
- Estimated number of taxa probably sourced from ANBG plantings: 35 species

Background

The purpose of the weeding in the Australian National Botanic Gardens (ANBG) was to remove, from upper sections of the gardens near to Black Mountain Nature Reserve, woody species that do not occur naturally on Black Mountain (i.e. are not indigenous there, based on Gray & McKee 1969) and that are known to be invasive in, or have the potential to invade, the reserve.

The focus of the weeding was to remove naturalized Sollya (*Billardiera heterophylla*) and Cootamundra Wattle (*Acacia baileyana*) plants. Other woody species not native to Black Mountain were also removed systematically, and some herbaceous weeds removed opportunistically.

Weeding effort

Friends of Black Mountain (FoBM) and Friends of ANBG carried out five weeding sessions in ten sections of ANBG that retain the native trees and understory and are no longer maintained as planted areas (see Table 1 and Figure 1). Planting records were checked prior to weeding activities, and proposed weeding discussed with and cleared by senior ANBG gardening staff. Where current plantings were known to be present, care was taken to ensure no tagged plants were removed.

Table 1. Summary of Friends' weeding effort in ANBG

Date	Section/s targeted	Number of people	Time in field (hours)	Total effort (hrs) (people x time)*
2 March	185	15	c. 3	44.75
6 April	185, 186	8	c. 3	29.0
4 May	186, 187	7	c. 3	25.5
1 June	187, 188, 156, 167	11**	c. 1.5	28.75
6 July	58, 187, 188, 156, 167, 89, 93, 166	11**	c. 3	35.5
			Total	**163.5**

* Includes preparation time such as topping up weeding wands and cleaning tools afterwards

** Included some Friends of ANBG members

Friends systematically walked throughout each section shown in the table. Woody weed species located were either pulled out with minimal soil disturbance, or the stems cut low to the ground and poisoned (cut and dab) using weeding wands or similar. Herbaceous weeds were pulled out of the

ground. All plants destroyed were left *in situ* to rot unless they had mature fruit on them; the latter plants were left on the road-sides for disposal by ANBG staff.

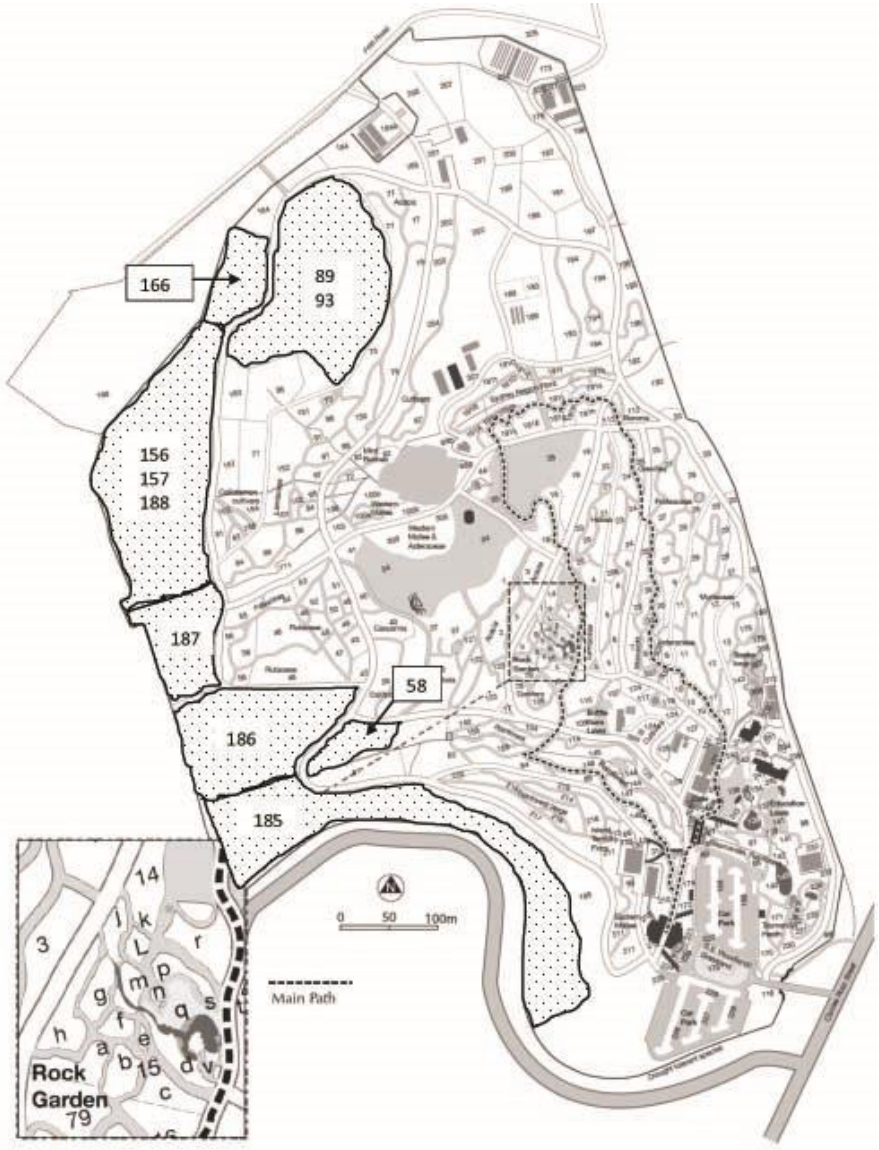

Figure 1. Map of ANBG showing location of sections weeded by Friends (stippled areas).

Outcome of weeding activities

A total of 163.5 people hours was spent weeding in ANBG (see Table 1). The names and approximate numbers of all woody species removed are shown in Table 2. Fourty-nine species were located, and an estimated 1800-2000 plants removed in total. Ten species not native to Australia were present in low numbers. The remaining 39 species are native to Australia but not indigenous to Black Mountain. Thirty five of these 39 species are likely to be adventive plants originating from seed dispersed from parent plants cultivated in ANBG garden beds.

The most common native, non-indigenous species removed were:

- Sollya (*Billardiera heterophylla*): c. 650 plants
- Cootamundra Wattle (*Acacia baileyana*): c. 500 plants
- Sweet Pittosporum (*Pittosporum undulatum*): c. 300 plants
- Sydney Golden Wattle (*Acacia longifolia*): c. 60 plants
- Blackwood (*Acacia melanoxylon*): c. 55 plants.
- Black Wattle (*Acacia decurrens*): c. 50 plants
- Howitt's Wattle (*Acacia howittii*): c. 50 plants

Many of the Sollya, Cootamundra Wattle and Black Wattle plants removed, and some Blackwood, Sydney Golden Wattle and Howitt's Wattle, were mature plants that probably have a seed store remaining in the soil. The majority of the Sweet Pittosporum plants were seedlings or saplings less than 30 cm tall that had not reached sexual maturity.

Herbaceous species removed opportunistically included plants of Fleabane (*Conyza*), Scotch Thistle, Cleavers (*Galium aparine*), and *Viola.*

Table 2. Woody weed species removed from ANBG upper sections.
Species shown in bold are most likely adventives species sourced from ANBG plantings.

	Approximate number of plants removed						
Woody species removed	**Section 58**	**Sections 89, 93**	**Section 166**	**Section 185**	**Section 186**	**Sections 187, 188, 156, 157**	**Total all sections**
Acacia baileyana		248	12	50-60	60-80	120	**490-520**
Acacia binervata #				2			**2**
Acacia boormanii					3		**3**
Acacia cardiophylla #						5	**5**
Acacia covenyi		1					**1**
Acacia decurrens					10-15	38	**48-53**
Acacia elata #		1		1			**2**
Acacia floribunda #		1					**1**
Acacia howittii #		1				51	**52**
Acacia longifolia #		51	1		1	6	**59**
Acacia melanoxylon #	5	3		20	20-30		**48-58**
Acacia rubida				2	7		**9**
***Acacia* sp. 1**						22	**22**
***Acacia* sp. 2**		40					**40**
***Acacia* sp. 3**					1		**1**
Acacia ?terminalis						1	**1**
Acacia uncinata		1					**1**
Acacia verniciflua		8					**8**
Billardiera heterophylla #	21	63		100-150	70-80	350	**604-664**
***Callitris* sp.**	35				3		**38**
***Cassinia* sp.**						3	**3**
**Cotoneaster sp.*		1				2	**3**
Correa reflexa					3		**3**
**Crataegus* sp.				2	2	2	**6**
***Crowea* sp**.					3		**3**
Einadia hastata				3	4		**7**

	Approximate number of plants removed						
Woody species removed	**Section 58**	**Sections 89, 93**	**Section 166**	**Section 185**	**Section 186**	**Sections 187, 188, 156, 157**	**Total all sections**
Grevillea robusta						2	**2**
Grevillea rosmarinifolia [#]				1			**1**
***Grevillea* sp. 1**					3-5	4	**7-9**
***Grevillea* sp. 2**					3-5		**3-5**
***Grevillea* sp. 3**					1		**1**
***Grevillea* sp. 4**						1	**1**
***Grevillea* spp.**					10	2	**12**
**Hedera* sp.					3-5	5	**8-10**
**Ligustrum sinense*		3			5-6		**8-9**
**Lonicera japonica*					1	2	**3**
**Nandina* sp.		2					**2**
***Persoonia* sp.**					2	2	**4**
***Persoonia* sp. 1**						2	**2**
***Persoonia* sp. 2**						2	**2**
Pittosporum angustifolium				1			**1**
Pittosporum undulatum	98			6	65-75	130	**299-309**
***Platysace* sp.**					1		**1**
***Pultenaea* sp.**					3		**3**
**Pyracantha* sp.				2	3-5		**5-7**
**Rubus* sp. (Blackberry)				2	2	9	**13**
**Trema* sp. (?)					1		**1**
***Zieria* sp.**					1		**1**
*Unknown deciduous species						3	**3**
						Total	**1843-1968**

* Introduced weeds

[#] Species recorded as a woody weed in Black Mountain Nature Reserve (based on R.Purdie unpublished data, 2009)

General comments

Of the seven most common woody weed species removed, five are likely to be derived from plantings in ANBG, viz. Sollya (*Billardiera heterophylla*), Sweet Pittosporum (*Pittosporum undulatum*) Sydney Golden Wattle (*Acacia longifolia*), Howitt's Wattle (*Acacia howittii*) and Blackwood (*Acacia melanoxylon*). Adventive *Callitris* were also common in Section 58 (adjacent to the gymnosperm plantings in Section 38). The invasive nature of these species suggests ANBG needs to be vigilant in controlling adventive plants within the formal planted sections of the Gardens as well as in the upper sections with native vegetation.

Of the 35 taxa that are probably derived from ANBG plantings, *Acacia* and *Grevillea* had the most adventive taxa (15 species of *Acacia* and at least seven species of *Grevillea*); some of the species of both taxa have been recorded as weeds on the eastern side of Black Mountain in the Nature Reserve. Except for the common species outlined in the previous paragraph, most of the other taxa were present in small numbers.

The ten exotic/non-native woody species recorded and removed during the weeding activities were all present in low numbers and mostly located in or near the creek lines. Some herbaceous exotic weeds (e.g. Fleabane) were widespread within the sections, while others (e.g. Cleavers and *Viola*) tended to occur in moister habitats along the creeks.

Plants of one native species, *Einadia hastata,* were removed from sections 185 and 186 during the initial two weeding sessions. This was prior to receiving advice from the ACT Government that, although the species is not recorded as indigenous to Black Mountain in Gray & McKee (1969), it is considered an uncommon species in the Territory and they would prefer it be retained on Black Mountain.

Considering the large number of taxa cultivated in the ANBG, the 35 'feral' native species recorded during the weeding activities represent a small proportion of all ANBG plantings. However the presence of these species in the sections adjacent to Black Mountain Nature Reserve highlights the importance of keeping the upper sections of the Gardens in a natural state, to act as a buffer between the Gardens' cultivated sections and the Reserve to help minimize native species from ANBG invading the reserve. Regular checks for adventive plants in these sections are desirable (e.g. every five years) to remove 'feral' plants that have germinated from the soil seed store or from newly introduced seed from cultivated sections of the Gardens.

References

Gray, M. and McKee, H.S. (1969) A list of vascular plants occurring on Black Mountain and environs, Canberra, ACT. CSIRO Division of Plant Industry Technical paper No. 26.