



Mr Gary Rake
Chief Executive
National Capital Authority
GPO Box 373
CANBERRA ACT 2601

Dear Mr Rake

Red Hill Woodland Inappropriate for Embassy Use

The environmental and social values of the Federal Golf Club lease area indicate that it would be inappropriate to develop this land for embassy use. The Red Hill Regenerators trust that the National Capital Authority (NCA) will reach this same conclusion. To assist the NCA in its deliberations the Red Hill Regenerators have prepared the enclosed report that documents the conservation values of the proposal area and describes the values of the adjoining Canberra Nature Park and how they would be significantly impacted by embassy development on adjoining land.

In summary, three quarters of the golf club lease area support high condition, critically endangered box–gum woodland, of very high plant richness and diversity. It is the habitat of hundreds of rare plants and a large proportion of Red Hill’s tree hollow roosting/breeding fauna. The proposal area contains 2,675 native trees, some of which are over 200 years old.

The woodland within the lease area is an integral, contiguous and important component of the wider Red Hill woodland remnant. This remnant is of national significance because of its large size, good condition, high plant diversity and the large number of rare and threatened species that it supports.

Locating embassies on this land would require clearance of the woodland within the golf club lease, while road widening and connection to telecommunication, power, electricity and water infrastructure will require significant earthworks within the adjoining Nature Park. The thin ribbon-like shape of the land and the fact that dense woodland is located to its north and west means that either the majority of the golf club land would need to be converted to fire asset protection zones not containing embassy buildings or significant removal of vegetation and habitat would need to occur within the nature park. Locating buildings on this land would also create an urban edge within what is now largely core woodland. This intrusion will increase the presence of weeds and feral animals within the Red Hill woodland, and will make this part of Red Hill unsuitable for sensitive native species, such as the declining and threatened woodland birds that currently occur within the lease area and adjoining woodland.

It is obvious from the comments posted on your web site that the large trees and woodland character of the land is highly valued and used by the local and wider community. The Red Hill Regenerators have spent hundreds of hours controlling weeds within the lease area and in terms of our wider efforts on Red Hill have been supported by over twenty-five local resident, school, scout, venture, church, boy’s brigade and conservation groups, with over a thousand people having been actively

engaged in restoring Red Hill's nationally significant woodland. Considerable community effort and government resources have been expended on the enhancement of Red Hill's conservation values. The success of this effort will be significantly undermined if embassy development occurred on the golf club lease.

In neighbourhood plans prepared by the ACT Planning Authority, protection and enhancement of open space and the environment is the key value expressed by residents of all the suburbs surrounding Red Hill. The embassy proposal is clearly at odds with local community values and aspirations.

It is telling that the sites that the NCA is currently considering for embassy development have not been selected by a process of review of all possible lands, or that the sites under consideration are the best available options. Even without such a review it is clear that there are alternative embassy sites to that of the golf club lease that would not result in the loss of over 10 hectares of much valued critically endangered woodland and the degradation of a much wider area of woodland on an adjoining reserve.

The Red Hill Regenerators trust that the NCA will readily recognize the un-suitability of the Red Hill site for embassies, and requests to be informed of the NCA position as a matter of urgency.

Yours sincerely

Julie Toms
President
Red Hill Regenerators
15 October 2011



Conservation values of proposed development area within Federal Golf Club Lease

Summary

The golf club lease area has considerable environmental value, both in its own right and as an integral part of the wider Red Hill woodland. In its own right the 15 ha lease area:

- Contains over 11 ha of critically endangered box –gum woodland;
- Contains 35 plant species that are considered by the Commonwealth as important species of the vegetation type, and 48 species which a NSW Department of Environment woodland and grassland rating system considers of very high regional significance;
- Relative to other grassy ecosystem remnants, the golf club lease woodland has a very high to exceptional diversity and richness of native plants;
- It supports 462 plants of four species considered rare in the ACT. These rare plants are scattered widely across the woodland at 159 different locations;
- Is an ACT stronghold of one of these rare species, *Dianella longifolia var longifolia*;
- It contains 2,675 native trees;
- Yellow box comprise 41% of the trees. Scientific study has enabled the age of yellow box in the Canberra area to be estimated from the diameter of their tree trunks. The lease area contains 81 yellow box trees estimated to be 94 – 140 years old, 41 between 140 – 187 years old, 14 between 187 – 257 years old and 6 older than 257 years;
- The tree age structure is generally consistent with that of now rare little modified woodland;
- It contains what are now relatively uncommon nesting trees of the gang gang cockatoo, listed as threatened in NSW due to recent dramatic decline in its overall numbers; and
- The trees on the land retain or could sequester the equivalent annual CO₂ emissions of over 500 ACT residents.

Red Hill's 375 ha woodland is of national significance due to its very large size, plant diversity and number of rare and threatened species its support. The golf club lease area is an important and integral component of the wider woodland as it:

- Contains about 400 large hollow bearing trees, which is a large percentage of the total tree hollow resource on Red Hill. These large hollow bearing trees are important for maintaining local bird, possum and bat populations;
- Is the only known Red Hill location of several plant species, adding to the overall diversity;
- It is breeding and/or foraging habitat of several of the rare and threatened animal species found on Red Hill and adds to the local viability of these species. Threatened or rare species present in the lease area include the speckled warbler, double-barred finch, white-winged triller, gang gang and southern whiteface; and
- Much of the woodland in the lease area, is core woodland away from the urban edge, which is relatively uncommon on Red Hill and is habitat that some of Red Hill's wildlife can only be located in.

Conservation values of proposed development area within Federal Golf Club Lease

Red Hill Regenerators Parkcare Group October 2011

1. Purpose of paper

This paper documents the conservation values of land leased by the ACT Government to the Federal Golf Club for golfing purposes, but which is not required for this purpose and supports significant woodland. This woodland is a contiguous and integral part of a 375 hectare woodland remnant found on Red Hill. Most of Red Hill is part of Canberra Nature Park and is managed for its conservation values. Currently the golf club is proposing that embassies be established over the golf club woodland. This is the sixth attempt by the golf club to develop the area. This paper documents the inappropriateness of such development both in relation to the conservation values present within the lease area and in terms of the significant direct and indirect impacts that such development will have on the adjoining nature park.

2. Significance of Red Hill's endangered woodland

The woodland on Red Hill is a component of the White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands, which was listed nationally as critically endangered on 17 May 2006. Yellow Box - Red Gum Grassy Woodland has been listed as endangered in the ACT since 19 May 1997.

2.1 Large size

Red Hill supports one of the largest remaining remnants of the endangered yellow box – Blakely's red gum grassy woodland in Australia. This woodland type once covered over 25,000 square kilometres, in a belt stretching from Melbourne to South Queensland. Over 90% of this vegetation belt is now cleared.¹ Leaving this woodland highly fragmented and generally existing as isolated patches smaller than 5ha in area.²

“In terms of size, connectivity, diversity and condition, the ACT remnants are exceptional, especially the presence of larger patches (over 100 ha) in good condition.”³ Remnants greater than 200ha are extremely rare. There are only four remnants left in Australia of 1000ha or more and all are in the ACT⁴. There are no Yellow Box - Red Gum remnants greater than 100ha in Victoria or the Murray catchment of NSW⁵, and there are no remnants of 200ha or greater in southern NSW⁶.

¹ listing advice for White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands - 2006, Department of the Environment, Water, Heritage and the Arts p9

² Gibbons P. and Boak M. (2000) *The Importance of Paddock Trees for Conservation in Agricultural Landscapes*. A discussion paper for consideration by the Riverina Highlands Regional Vegetation Committee. NSW National Parks and Wildlife Service.)

³ listing advice for White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands - 2006, Department of the Environment, Water, Heritage and the Arts, p.5

⁴ ACT Government (2004) Woodlands for Wildlife: ACT Lowland Woodland Conservation Strategy. Action Plan No. 27. (Environment ACT, Canberra), Chapter 5.

⁵ Davidon I. (2005) Woodland Management Notes for the Murray Catchment. NSW Department of Environment and Conservation.

⁶ Rainer Rehwinkel, NSW Department of Environment and Conservation, Grassy Ecosystems Research Officer, Personal Communication.

Red Hill supports a Yellow Box -Red Gum woodland of about 275ha. It is a vital component of the second largest Yellow Box -Red Gum woodland remnant in Australia that covers about 1,200ha from Red Hill to East O'Malley- Symonston-Mugga Lane and Callum Brae. Although Hindmarsh Drive is a barrier to some species, most woodland plant and animal species are able to disperse across this highway.

2.2 High plant diversity

Because of its relatively large size and the good condition of the understorey, Red Hill supports one of the highest native plant diversities recorded in a Yellow-Box - Red Gum woodland remnant anywhere in Australia. 210 native woodland species have been recorded on Red Hill. The NSW National Parks and Wildlife Service has a database of plant species records from about 1000 grassy ecosystem (grassland + grassy woodland) sites across south-eastern NSW and the ACT. Fewer than 5% of these sites have a recorded plant diversity of over 100 species⁷. It is relevant that remnants of particularly high quality have been targeted in the surveys.

2.3 Large number of rare and threatened species

Given the size and diversity of its endangered woodland, it is not surprising that Red Hill supports important populations of many uncommon, rare or threatened species. It contains large populations of the nationally endangered daisy, the button wrinkelwort (*Rutidosia leptorrhynchoides*), and Swainson's silky pea (*Swainsonia sericea*), which is listed as vulnerable in NSW. Fourteen plant species considered rare in the ACT occur on Red Hill. The Hill is a major habitat for several of these species as well as being a habitat of over 50 regionally uncommon plant species. The invertebrate fauna of Red Hill has yet to be systematically surveyed, but given its relatively large size, plant diversity and good condition, it is likely to be of importance for woodland invertebrate conservation. It is an important known habitat of the vulnerable grasshopper, *Perunga ochracea*. Several ACT and/or NSW threatened birds as well as several regionally uncommon birds breed on the Hill.

In summary: Red Hill:

- contains one of the largest remaining remnants of its woodland type anywhere;
- supports one of the highest diversities of woodland plants recorded in South-eastern Australia; and
- is habitat for over 70 threatened, rare or regionally uncommon plant, bird, bat, lizard or grasshopper species.

3. Significance of woodland on Golf Club Lease area

The woodland within the golf club lease is an integral component of the nationally significant Red Hill woodland and contributes significantly to the overall plant diversity and population size of rare plants. Over half of Red Hill's plant species occur within the proposed development area. The proposed embassy land is the only Red Hill location of some woodland plants. This area also provides a significant component of the tree hollow habitat on the Hill. Even when considered in isolation from the wider adjoining woodland, the 15 ha of the development proposal are of outstanding floristic value and a highly significant representation of critically endangered woodland.

⁷ As per footnote number 5.



Location of area proposed to be developed for embassy use

3.1 Extent of critically endangered woodland within lease area

To classify as Box-Gum Woodland under *the Environmental Protection Biodiversity Conservation Act 1999* (EPBC), at least 50% of the perennial vegetation in the ground layer (that below 1m) must be made up of native species, and the canopy must be or was once dominated by one of the characteristic canopy species (i.e. they can be treeless, but must have or once had an overstorey dominated by yellow yox, Blakely's red gum and/or white box)⁸.

Over 11 ha or 73% of the embassy proposal area is dominated by perennial native grass species, including poa tussock (*Poa sieberiana*), corkscrew grass (*Austrostipa spp.*), wallaby grass (*Austrodanthonia spp.*), weeping grass (*Microlaena stipoides*) and kangaroo grass (*Themeda australis*). The extent to which native grasses make up more than 50% of the groundlayer would have been greater if weeds had been controlled and green waste (prunings, felled trees and grass clippings) had not been piled on top of native vegetation. It is relevant that much of the remaining 4 ha of golf lease land within the proposal area could be regenerated back to endangered woodland.

On the lease area there have been 2,675 native trees identified of which 1,109 are yellow box (41% of all trees) and 669 are red gums (25% of all trees).

Woodland with a native understorey and yellow box and or red gum as dominant species is considered by the Commonwealth to be part of the listed critically endangered ecological community if any one or more of the following criteria are met.

⁸ Australian Government (2006) White Box – Yellow Bx – Blakely's Red Gum grassy woodlands and derived native grasslands. EPBC Act Policy Statement. Dept. of the Environment and Heritage

1. *The vegetation patch must be greater than 0.1 ha, with a diverse ground layer made up of 12 or more native non-grass species, including a pre-defined 'important' species.* The EPBC listing nominates what an important species is⁹, and includes many species that are generally absent under prolonged grazing. As shown in **Map 1**, there are two patches of EPBC woodland present. One patch is 10.653 ha in area, the other is 0.363 ha. The large patch contains 89 native non-grass groundlayer species and 35 species which the Commonwealth considers important. The small patch has 13 non-grass ground storey species, including 4 important species. A list of species within the development area is provided at **Appendix 1**.
2. *Patches of native vegetation greater than 2 ha that include at least 20 trees per hectare, with a circumference of at least 125cm at 130cm above the ground.* There are 395 trees with a circumference >125 cm across the 15 ha area (26.3 trees per ha), while the density of such trees within the 10.65 ha is higher than that across the whole site; and/or
3. development area contains 395 trees of 125cm or more circumference at 130cm above the ground and 2,280 trees with a circumference between 15 cm and 125cm (see **Table 1**).

The majority of the development area overwhelmingly meets the Commonwealth's box-gum listing criteria. It is clearly critically endangered vegetation of high value.

3.2. Significant plant species

The Conservation Planning and Research Unit within the Environment and Sustainable Development Directorate of the ACT Government has recently produced a list of 162 plant species that are considered to be significant within the ACT. Their significance is due to their rarity, their highly restricted distribution, or because they are of biogeographic importance (e.g. endemic to the ACT or at distribution limit). At least 462 plants belonging to four different species rare in the ACT occur at 159 widely scattered locations across the proposed development area (see **Map 2**).

Unlike the rest of the ACT, all four of the rare plant species found in the lease area, are reasonably common on Red Hill, which is a local stronghold for these plants. Both Swainson's silky pea (*Swainsonia sericea* – 37 plants at 2 locations within the golf club lease) and yellow burr daisy (*Calotis lappulacea* – 8 plants at 3 locations) became abundant across Red Hill following the Boxing Day 2001 fire, and previously both plants have been common across the golf club lease area. It is therefore probable that seeds of both these species occurs widely within the topsoil of the development area, and that the importance of the golf club lease to these plants is even greater than their current distribution would suggest. The tick bush (*Indigofera adesmifolia* – 8 plants 3 locations) may also have a seed store under some of the recent piles of green waste, as fresh waste is currently piled next to or partly over four of these plants.

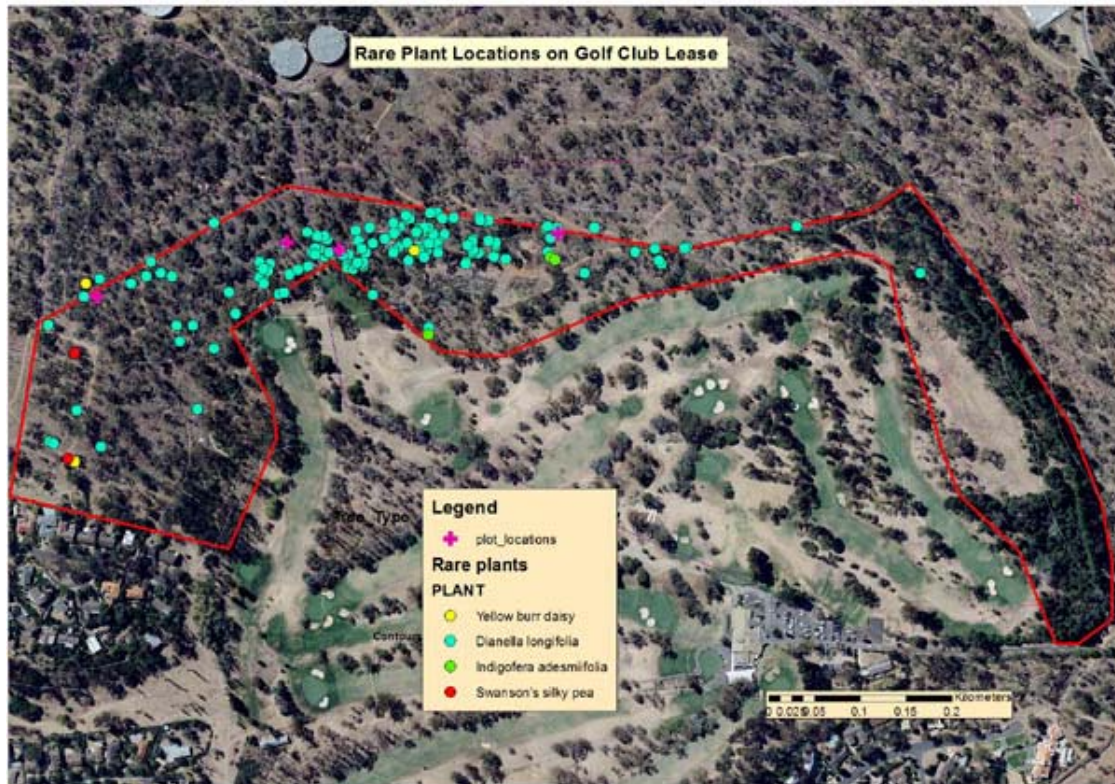
The proposed development area contains a major proportion of Red Hill's and probably ACT's occurrences of smooth flax lily (*Dianella longifolia* var. *longifolia* – 409 plants at 151 locations). This lily is sensitive to grazing. Most of the plants recorded within the proposal area are close to the golf links, and it may be that a relatively long history of grazing exclusion may explain its abundant occurrence within the lease area. Stock were either excluded or restricted from the golf course lease from the late 1950's while stock grazing continued over most of Red Hill until 1995.

⁹ <http://www.environment.gov.au/epbc/publications/box-gum.html>



The different grazing history may also explain why the proposed development area is the only known Red Hill location of a few other grazing sensitive species including golden sun moth orchid (*Diuris chryseopsis*), a greenhood orchid (*Pterostylus species*), slender onion orchid (*Microtis parviflora*) and daphne heath (*Brachyloma daphnoides*). The proposed development area also contains at least a third of the known Red Hill populations of small-leaf clematis (*Clematis microphylla*), mat grass (*Hemarthria uncinata*) and the semi-parasitic shrub (*Omphacomeria acerba*). It is likely that the lease area could not be developed, without major disturbance of vegetation within the existing golf club and summit road corridors. These roadside locations contain the only known Red Hill locations or a major proportion of the Red Hill population of several other species including a fireweed (*Senecio hispidulus* – a species rare in the ACT), western silver wattle (*Acacia decora*), Queensland blue grass (*Dicanthium sericeum*), and a native pelargonium (*Pelargonium inodorum*). In the 1997 Preliminary

Assessment of vegetation and fauna habitat of the lease area¹⁰, Rowell and Crawford located two more species (yam daisy – *Microseris lanceaolata* and narrow plantain – *Plantago gaudichaudii*) that are both now considered rare in the ACT and which are also very rare on Red Hill. Recently, these species could not be found again as they either have a sparse presence in the lease area, or as they both tend to occur low in the landscape, may have been subsequently smothered by spoil or green waste.



Map 2: Rare plant locations on proposed golf club lease development area

Rare plants are widespread across the lease and roadside areas. There is no doubt that development of the lease area would lead to extinction of several plant species on Red Hill and reduce the overall plant diversity found on the Hill – one of its major conservation values. Development would also negatively impact on important populations of several plant species now rare in the ACT.

3.3 Relative floristic richness of site

Since the 1990s, floristic data (plant species lists and cover abundance) has been collected in a standard way from grassy ecosystem sites across southern NSW and the ACT. Grassy ecosystem sites include Natural Temperate Grassland and lowland woodlands. Information has been collected from over 1000 sites in the region and relative floristic value calculated according to a set methodology for each site. This data set and methodology enables the relative floristic value of the woodland within the

¹⁰ Rowell A and Crawford I (1997) A Preliminary Assessment of Vegetation and Fauna Habitat at sites on and adjacent to the Federal Golf Course, August 1997. Prepared for Bligh Voller Nield

proposed development area to be compared with sites across the wider region. The methodology is described in detail by Rehwinkel (2007)¹¹.

In summary, floristic value is determined by the number and cover abundance of significant species present. The methodology requires that within polygons or vegetation patches of similar condition and type, 20 x 20m quadrats are located. Quadrats are placed in locations that are in the best condition in terms of native species cover and richness. A small polygon or vegetation patch will usually only require one quadrat, but multiple quadrats may be required in larger areas. Within each 20 x 20m quadrat, all plant species are recorded and their cover abundance assessed according to the Braun–Blanquet scale:

r	< 5% cover and solitary (<4 individuals)
+	< 5% cover and few (4-15 individuals)
1	< 5% cover and numerous/scattered (>15 individuals)
2	5% - 25% cover
3	26% - 50% cover
4	51% - 75% cover
5	>75% cover

The floristic value of the quadrat is determined by the number, type and cover abundance of significant species in each quadrat. Rehwinkel (2007) applied a significance score to the 650 plant species that occur within the grassy ecosystems of the region. Each species was placed into one of the following three groups:

1. Common or increaser species (c), which do not add much to the value of a site, and are not included in the analysis of floristic value;
2. “Indicator species, level 1”, which indicate that the site has value; and
3. “Indicator species, level 2”, which are the highly significant species; these are the rarest of the grassy ecosystems species and have the highest significance scores.

Floristic value is determined by adding the total number of indicator species found within a quadrat, except for indicator level 1 species that have 4 or less plants occurring within a quadrat (r plants). There is also an additional score according to the total number of indicator species (both level 1 and 2) that occur within a quadrat at cover abundance greater than 5% or with more than 4 occurrences.

Data was collected from four locations within the proposed development area. Two plots were located in the northern lease area and two in the woodland adjoining Hughes. Data sheets collected from within the proposed development area are at **Appendix 2**. The location of the plots from where the information was collected is shown on **Map 2**.

Across the ACT and North-western sub-region covering part of the Murrumbidgee and Lachlan River catchments (includes Boorowa, Crookwell, Yass, Gunning, Gundaroo and Queanbeyan Local Government Areas), floristic scores range from 0 to about 60. In terms of relative floristic value the scores reflect the following.

¹¹ Rehwinkel, R (2007). *A method to assess grassy ecosystem sites: Using floristic information to assess a site's quality*. NSW Department of Environment and Climate Change.

- < 5 little floristic value and dominated by exotic species and/or common native species
- 5 – 9 low floristic value
- 10 – 14 moderate floristic value with a few significant species
- 15 – 19 moderate to high floristic value
- 20 – 24 high floristic value many significant species present
- 25- 35 very high floristic value
- 35+ exceptional floristic value, site of very high diversity with numerous significant species present.

The scores from the four plots located within the development area are 25, 27, 43 and 46. In comparison to other grassy ecosystem remnants in the region, the proposed embassy development area has very high to exceptional floristic value. Two of the plots were amongst the highest scores from any of the more than 100 sites from which data has been collected in the ACT.

According to Rehwinkel (2007) of the 120 locally native plant species recorded in the development area 48 (40% of all species) are highly significant species (indicator level 2 species) within the context of the ACT and surrounding region.

3.4 Large number of trees and significant tree habitat

3.4.1 Tree size and age

As indicated in **Table 1**, the proposed embassy development area contains at least 2,675 trees above 15cm in circumference. Development of the area would result in a significant native tree loss. Some of the trees are likely to be over 300 years old and many of the trees are older than 100 years. The site contains 395 mature trees, many of which contain hollows that are utilised for breeding and shelter by many of Red Hill’s native bird, possum and bat species. **Map 3** illustrates the distribution of trees of the various size classes, while **Map 4** illustrates the distribution of the different native tree species. It is evident that the proposal area supports a high tree density.

There are 1,109 yellow box (*Eucalyptus melliodora*) within the lease area, which comprise 41% of all native trees found on the land. Banks (1997)¹² undertook a growth ring analysis of yellow box trees in the Canberra region. The study produced a spreadsheet for predicting the age of a yellow box tree from the Diameter at Breast Height (DBH) size. On average, yellow box takes about 95 years to reach a circumference of 125cm, which is the size recognised as a mature tree in the Commonwealth box gum policy statement. The age classes of yellow box found on the lease area are shown in Table 1. Dr Phil Gibbons of the Australian National University has collected data on the number of yellow box trees in each 10cm diameter age class that occur in woodlands that have had relatively little modification by humans since European settlement. The number of yellow box trees within the golf club lease area are for all classes consistent with that of largely unmodified woodland. The only exception is for trees with a DBH of > 80cm (trees 200+ years old), where the lease area contains

¹² Banks, J.C.G. 1997. Tree ages and ageing in yellow box. In Dargavel, J.(ed). Australia’s ever-changing forests III . Canberra, Centre for Resource and Environmental Studies, Australian National University, pp. 35-47.

about half as many old trees as can be found in unmodified woodland¹³. This suggests that the area may have been partially cleared in the early days of settlement, or that there has been selective clearing of larger trees, but that the area has not suffered major clearance.

3.4.2 Carbon storage and sequestration value

Using established allometric equations for eucalypt woodland trees Dr Sandra Berry (a Visiting Fellow at the Australian National University) has estimated the above-ground biomass of the 2627 living trees recorded in Table 1 at 1250 to 1450 tonnes (4600 - 5320 tonnes CO₂ equiv. or 625 - 725 tonnes of carbon). The total biomass (above-ground plus below-ground) is estimated to be 2000 - 2300 tonnes (7300 - 8400 tonnes CO₂ equiv. or 1000 - 1150 tonnes of carbon). Assuming that at carbon carrying capacity there would be twice as many trees having DBH of >80cm, the carbon sequestration potential is estimated at ~230 tonnes carbon (~850 tonnes CO₂ equiv) for the above-ground biomass, and around 370 tonnes carbon (1360 tonnes CO₂ equiv) for total biomass of the living trees.

The average per capita yearly emission of CO₂ by ACT residents is around 12 tonnes¹⁴. Thus clearing the site would release the equivalent emissions of that produced over one year by 416 residents and prevent the sequestration of carbon equivalent to the annual emissions of 113 residents.

3.4.3 Tree habitat

The Red Hill Regenerators parkcare group and others have placed over 100 nesting boxes on Red Hill. Boxes have been designed for a range of hollow nesting bird species, bats and possums. All boxes are quickly occupied by wildlife, which suggests that hollows are a limiting resource on Red Hill. As was common for many areas in Canberra, early settlers virtually denuded the Hill's upper slopes, while urban development has now encroached on most of the lower slopes, hence the shortage of large hollow-bearing trees. There are about 400 hollow bearing trees within the proposed development area. They are likely to comprise a major percentage of the hollow-bearing tree resource on Red Hill, and be of importance to maintaining local wildlife. Not only does the development area contain a relatively high number of hollow-bearing trees, but many of the trees have large hollows that only develop in very old trees. Bigger birds, such as Galahs, Sulphur Crested Cockatoos, Gang Gangs and Wood Ducks, which have all been recorded breeding in the proposed development area, require hollows of at least 15cm in diameter. The King Parrot is another bird observed breeding in the development area, it requires trees with deep hollows that go metres down the tree. Trees bearing big hollows are an even rarer local resource. Other hollow breeding species observed in the development area include Crimson and Eastern Rosellas, Red-rumped Parrot, the Striated Pardalote, Kookaburra, Southern Boobook, Sugar Glider and Brush-tail Possum. As part of any development assessment the importance of the proposed embassy area for hollow breeding wildlife should be determined.

¹³ Phil Gibbons, Fenner School, ANU (personnel communication - data has been submitted for publication in a scientific journal)

¹⁴

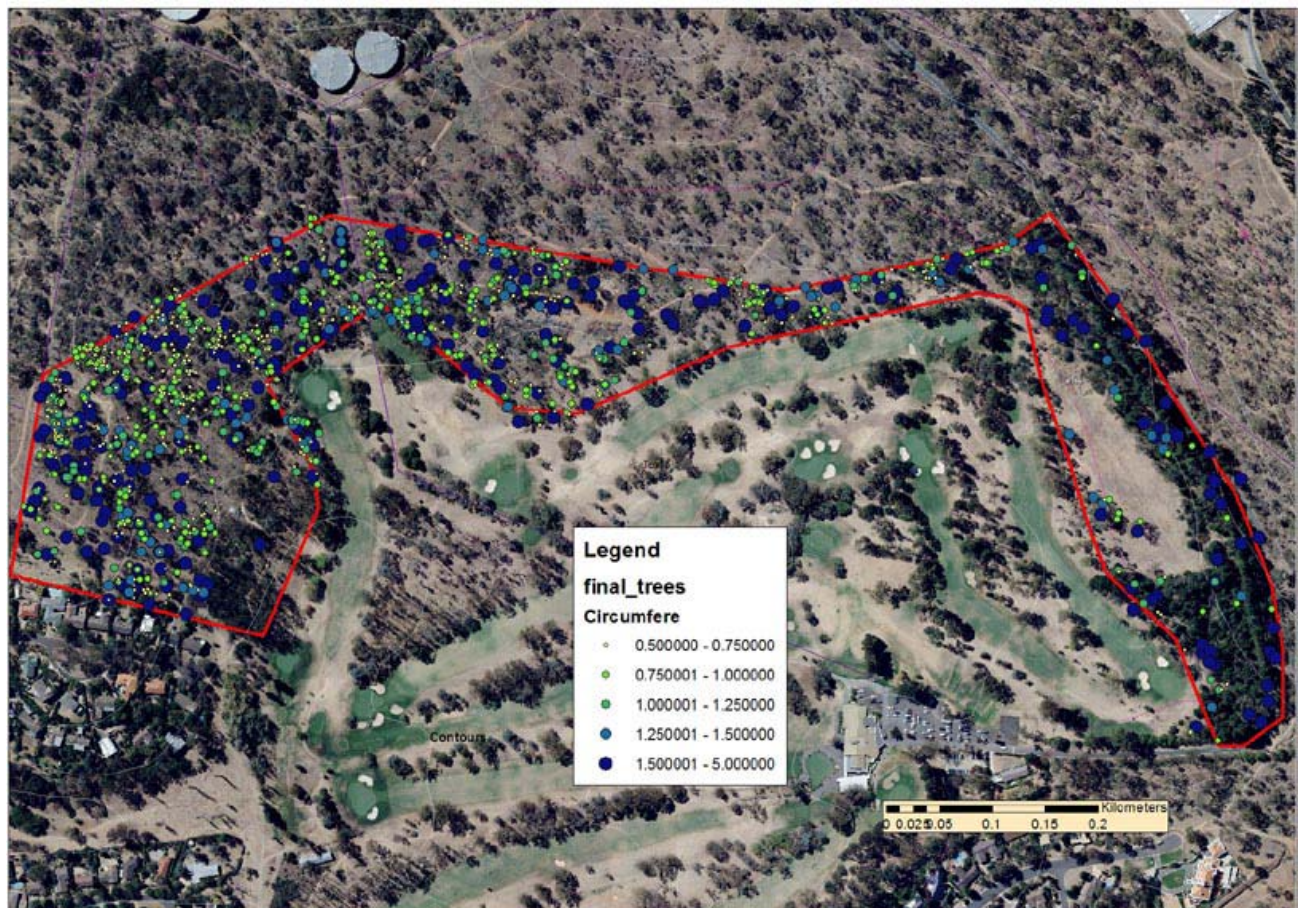
http://www.environment.act.gov.au/__data/assets/pdf_file/0007/160936/20090803_factsheet_inventory_2.pdf

TABLE 1 – Number + size of trees in proposed embassy development area

Size range Circumference (cm)	Size Range DBH (cm)	Number of trees	Estimated mean age of Yellow Box trees (years)
15 – 49.9	4.7 - 16	Yellow Box = 488 Red Gum = 358 Apple Box = 430 Other trees = 90 Total trees = 1366	< 38
50 – 61.9	16 - 20	Yellow Box = 161 Red Gum = 71 Apple Box = 25 Other trees = 8 Dead trees = 9 Total trees = 274	38 - 46
62 – 93.9	20 –30	Yellow Box = 203 Red Gum = 92 Apple Box = 94 Other trees = 10 Dead trees = 33 Total trees = 432	47 - 70
94 – 125.9	30 - 40	Yellow Box = 115 Red Gum = 42 Apple Box = 81 Other trees = 2 Dead trees = 9 Total trees = 249	70 - 94
126 – 156.9	40 - 50	Yellow Box = 62 Red Gum = 30 Apple Box = 41 Dead trees = 4 Total trees = 137	94 - 117
157 - 188	50 - 60	Yellow Box = 19 Red Gum = 21 Apple Box = 21 Other trees = 1 Dead trees = 3 Total trees = 65	117 - 140

TABLE 1. Continued.

Size range Circumference (cm)	Size Range DBH (cm)	Number of trees	Estimated mean age of Yellow Box trees (years)
188 - 219	60 - 70	Yellow Box = 18 Red Gum = 18 Apple Box = 14 Dead trees = 5 Total trees = 55	140 - 163
219 - 251	70 - 80	Yellow Box = 23 Red Gum = 13 Apple Box = 11 Dead trees = 2 Total trees = 49	163 - 187
251 - 282	80 - 90	Yellow Box = 7 Red Gum = 12 Apple Box = 5 Dead trees = 3 Total trees = 27	187 - 211
282 - 314	90 - 100	Yellow Box = 4 Red Gum = 6 Apple Box = 6 Dead trees = 4 Total trees = 20	211 - 234
314 - 345	100 - 110	Yellow Box = 3 Red Gum = 3 Apple Box = 1 Total trees = 7	234 - 257
345 - 377	110 - 120	Yellow Box = 1 Red Gum = 3 Apple Box = 6 Total trees = 9	257 - 280
377 - 408	120 - 130	Yellow Box = 2 Apple Box = 2 Dead tree = 1 Total trees = 5	280 - 304
408 - 471	130 - 150	Yellow Box = 3 Apple Box = 2 Dead tree = 1	304 - 351



Map 3 – Distribution of trees and their size (circumference in cm, 1.3m above ground) across lease area

4. Other Wildlife values

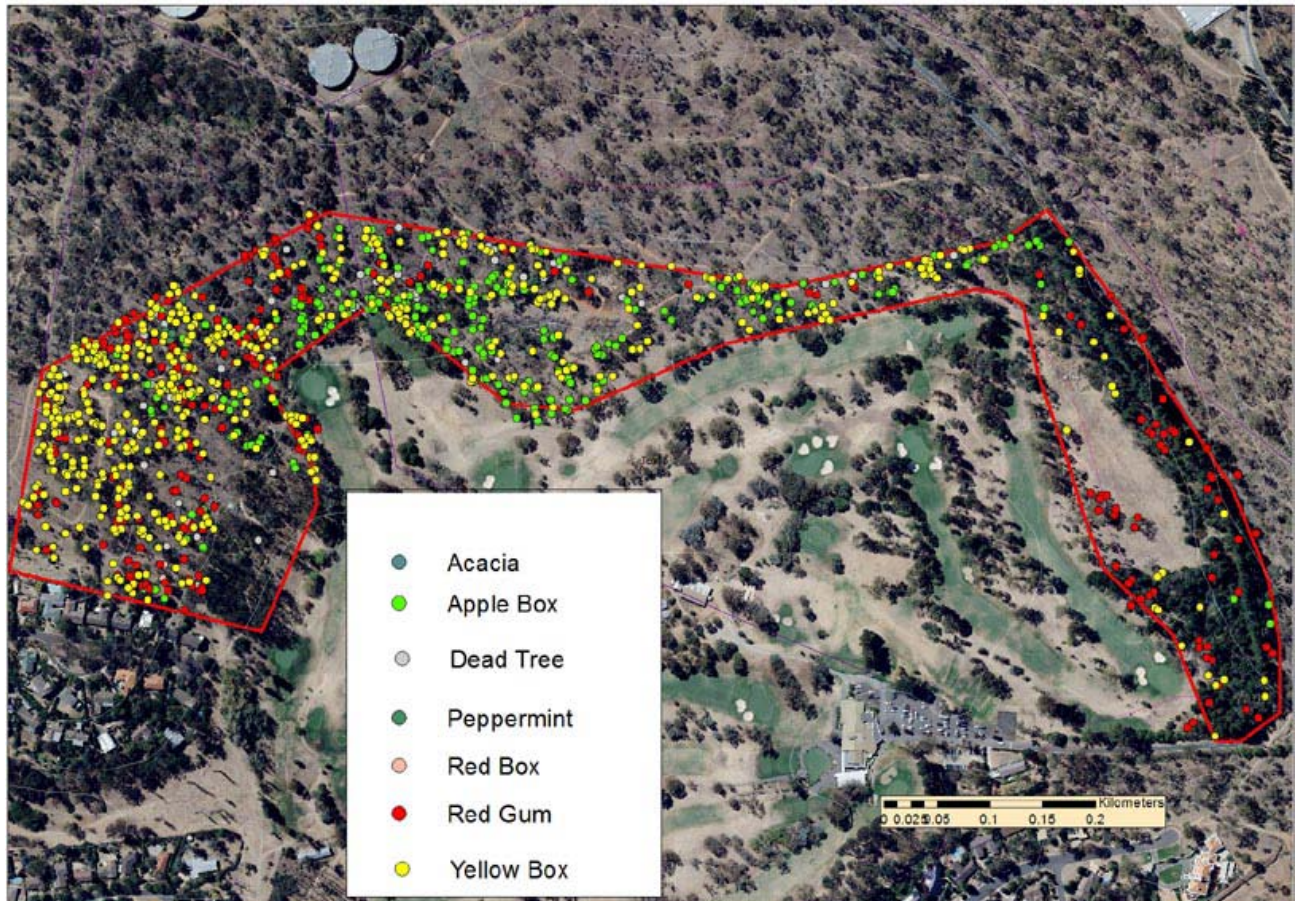
The proposed development area is yet to be subject to systematic or targeted fauna survey, which would need to occur as part of any assessment of the suitability of the site for embassies. Nevertheless as a contiguous integral component of Red Hill woodland it contributes to the overall habitat value and viability of Red Hill’s fauna.

The proposed development area contains suitable habitat of the vulnerable Perunga grasshopper, which has been recorded nearby. It also contains apparently suitable habitat of the regionally uncommon Key’s matchstick grasshopper, which has yet to be recorded on Red Hill, but does occur lower in the landscape in Themeda dominated grasslands such as that which is found within the lease area. As part of a rare patch of large critically endangered woodland, it is likely that the area supports now rare and restricted invertebrate fauna, which has yet to be documented on Red Hill.

The size and variability of woodland habitat on Red Hill is also likely to be important in maintaining local animal populations, such as of the echidna, bearded dragon, three-toed skink and sugar glider, all which have been recorded within the lease area.

As discussed above, the area does provide tree hollow habitat, which is important in maintaining local tree-hollow breeding/roosting species. **Table 2** provides a list of those bird species that have been opportunistically sighted within the proposed development area. The list includes several threatened

species and/or birds that are recognized as in significant decline in the region¹⁵. These include the double-barred finch (breeding in the proposed development area), southern whiteface, rufous whistler, white-winged triller (threatened in the ACT), leaden flycatcher, Gang-Gang Cockatoo (threatened in NSW and breeding in proposed embassy area), little eagle (threatened in the ACT, but not recorded on Red Hill since nearby nesting site was disturbed through building of the adjacent East O'Malley) and the speckled warbler (threatened in NSW).



Map 4 – Distribution of tree types across lease area

It is relevant that a 1 August 2010 Gang Gang census of Central Canberra observed a total of 15 birds. Five of these birds were observed on the golf lease or adjacent Red Hill reserve¹⁶.

The 1997 flora and fauna assessment for residential development of the same area of land concluded that the development may result in the local extinction of the Speckled Warbler. The Red Hill Regenerators are also seriously concerned about what the development will mean to the survival of other woodland birds on Red Hill. A current study by Karen Stagoll, of the Fenner School ANU, has found that some birds can thrive in the urban environment, others will occur on the edge of nature reserves, but a group of birds, including many of the declining woodland birds, will only occur in

¹⁵ Reid J. (1999) Threatened and declining birds in the NSW Sheep Wheat Belt. A report to the NSW National parks and Wildlife Service + Canberra Ornithologist Group website - canberrabirds.org.au

¹⁶ Leonard J (2010) Central Canberra Gang-gang Census 1 August 2010. Canberra Bird Notes Vol 35 (3) 202-204.

woodland core areas more than 100m distant from the urban edge. Locating embassies on the proposed land will significantly reduce the area of core woodland within the Red hill nature reserve. The proposal is likely to impact adversely on other threatened and declining woodland birds recorded in adjoining Red Hill woodland, such as the scarlet robin, varied sitella and flame robin.

Table 2: Birds recorded within the proposed embassy development area

Bird	Recorded Breeding in area	Bird	Recorded Breeding in area
Australian King-Parrot	Yes	Striated Thornbill	
Australian Magpie	Yes	Sulphur-crested Cockatoo	Yes
Australian Raven		Superb Fairy-wren	Yes
Australian Wood Duck	Yes	Weebill	
Black-faced Cuckoo-		White-browed Scrubwren	Yes
Brown Goshawk		White-eared Honeveater	
Brown Thornbill		White-throated Gerygone	
Buff-rumped Thornbill		White-throated Treecreeper	
Collared Sparrowhawk		White-winged Chough	
Crested Pigeon		White-winged Triller	
Crimson Rosella	Yes	Willie Wagtail	
Double-barred Finch	Yes	Yellow-faced Honeveater	
Eastern Rosella	Yes	Yellow-tailed Black Cockatoo	
Eastern Spinebill			
Galah	Yes		
Gang-gang Cockatoo	Yes		
Golden Whistler			
Grey Currawong			
Grey Butcherbird	Yes		
Grey Fantail			
Grey Shrike-thrush			
Laughing Kookaburra			
Leaden Flycatcher			
Little Eagle			
Magpie-lark	Yes		
Masked Lapwing			
Noisy Friarbird			
Noisy Miner			
Olive-backed Oriole			
Pallid Cuckoo			
Pied Currawong			
Red Wattlebird			
Red-browed Finch	Yes		
Red-rumped Parrot			
Rufous Whistler			
Sacred Kingfisher			
Satin Bowerbird	Yes		
Satin Flycatcher			

Silvereye			
Southern Boobook			
Southern Whiteface			
Speckled Warbler			
Spotted Pardalote			
Striated Pardalote			
Striated Thornbill			

Appendix 1 – Native plant species present in the development area

Latin Name	Common name	On EPBC list of box gum plants	On EPBC list of important plants	Rehwinkle significance category
<i>Acacia buxifolia</i>	Box-leaf Wattle			2
<i>Acacia dealbata</i>	Silver Wattle	Y		2
<i>Acacia decurrens</i>	Green Wattle	Y		2
<i>Acacia implexa</i>	Hickory Wattle			2
<i>Acacia mearnsi</i>	Green Wattle	Y		2
<i>Acacia pravissima</i>	Wedge-leaved Wattle			
<i>Acacia rubida</i>	Red-leaf Wattle	Y		2
<i>Acaena novae-zelandiae</i>	Bidgee Widgee	Y		c
<i>Acaena ovina</i>	Sheeps Burr	Y		c
<i>Agrostis avenacea</i>	A Blown Grass			c
<i>Amyema miquelii</i>	A mistletoe			
<i>Aristida ramosa</i>	Purple Wiregrass			c
<i>Asperula conferta</i>	Common Woodruff	Y	Y	2
<i>Austrodanthonia caespitosa</i>	Ringed Wallaby Grass	Y		
<i>Austrodanthonia fulva</i>	A Wallaby Grass			
<i>Austrodanthonia sp.</i>	A Wallaby Grass			c
<i>Austrostipa bigeniculata</i>	Tall Speargrass	Y		c
<i>Austrostipa scabra</i>	Corkscrew Grass	Y		c
<i>Bossiaea buxifolia</i>	Box-leaved Bitter pea	Y	Y	2
<i>Bothriochloa macra</i>	Redleg Grass	Y		c
<i>Brachychiton populneus</i>	Kurrajong	Y		
<i>Brachylomla daphnoides</i>	Daphne Heath	Y		2
<i>Bracteantha viscosa</i>	Sticky Everlasting	Y		
<i>Bulbine bulbosa</i>	Bulbine Lily	Y	Y	2
<i>Bursaria spinosa</i>	Blackthorn	Y		c
<i>Calotis lappulacea</i>	Yellow Burr-daisy	Y	Y	2
<i>Carex inversa</i>	Knob Sedge	Y		c
<i>Cassinia aculeata</i>	Dolly Bush	Y		c
<i>Cassinia longifolia</i>		Y		c
<i>Cassinia quinquefaria</i>	Cauliflower Bush	Y		c
<i>Cheilanthes</i>	Rock Fern	Y		2

Latin Name	Common name	On EPBC list of box gum plants	On EPBC list of important plants	Rehwinkle significance category
<i>Cheilanthes sieberi</i>	Rock Fern	Y		2
<i>Chenopodium pumilo</i>	Small Crumbweed	Y		c
<i>Chloris truncata</i>	Windmill Grass	Y		c
<i>Chrysocephalum</i>	Yellow Buttons	Y	Y	1
<i>Chrysocephalum</i>	Clustered Everlasting	Y	Y	2
<i>Clematis microphylla</i>	Small-leaf Clematis	Y		2
<i>Convolvulus angustissimus</i>	Australian Bindweed	Y		c
<i>Crassula sieberiana</i>	Australian Stonecrop	Y		c
<i>Cryptandra amara</i>	Bitter Cryptandra	Y		2
<i>Cymbonotus lawsonianus</i>	Austral Bears-ear	Y		c
<i>Cynodon dactylon</i>	Cooch Grass			c
<i>Cynoglossum suaveolens</i>	Sweet Hound's Tongue	Y		c
<i>Daucus glochidiatus</i>	Native Carrot	Y	Y	c
<i>Desmodium varians</i>	Slender Tick Trefoil	Y	Y	2
<i>Dianella longifolia</i>	A Flax Lily	Y	Y	2
<i>Dianella revoluta</i>	Black-anthered Flax	Y	Y	2
<i>Dichelachne</i> sp.	A Plume Grass	Y	Y	c
<i>Dichondra repens</i>	Kidney Weed	Y		c
<i>Dichopogon fimbriatus</i>	Nodding Chocolate Lily	Y	Y	2
<i>Diuris chryseopsis</i>	Golden moth orchid	Y	Y	2
<i>Dodonea viscosa</i> ssp	Hop Bush			2
<i>Echinopogon ovatus</i>	Forest Hedgehog Grass	Y		c
<i>Einandria nutans</i>	Climbing Saltbush	Y		c
<i>Elymus scaber</i>	Wheatgrass	Y		c
<i>Enneapogon nigricans</i>	Bottlewashes	Y		c
<i>Epilobium billardierianum</i>	A Willowherb			c
<i>Eragrostis trachycarpa</i>				c
<i>Eryngium rostratum</i>	Blue Devil	Y		2
<i>Eucalyptus blakelyi</i>	Blakley's Red Gum	Y		c
<i>Eucalyptus bridgesiana</i>	Apple Box	Y		c
<i>Eucalyptus dives</i>	Broad-leaved	Y		c
<i>Eucalyptus melliodora</i>	Yellow Box	Y		c
<i>Eucalyptus polyanthemus</i>	Red Box	Y		c
<i>Euchiton involucratus</i>	Star Cudweed	Y		c
<i>Exocarpus cupressiformis</i>	Native Cherry	Y	Y	
<i>Galium gaudichaudi</i>	Rough Bedstraw	Y	Y	c
<i>Geranium potentilloides</i>				c
<i>Geranium solanderi</i>	Native Geranium	Y		c
<i>Glycine clandestina</i>	Twining Glycine	Y	Y	2
<i>Glycine tabacina</i>	Glycine Pea	Y	Y	2
<i>Gonocarpus tetragynus</i>	Common Raspwort	Y		1
<i>Goodenia pinnatifida</i>	Scrambled Eggs	Y	Y	2
<i>Grevillea juniperina</i>				
<i>Hardenbergia violacea</i>	False Sarsaparilla	Y	Y	2
<i>Hemarthria uncinata</i>	Matgrass			2
<i>Hibbertia obtusifolia</i>	Grey Guinea Flower	Y	Y	c
<i>Hovea heterophylla</i>	Creeping Hovea	Y	Y	2

Latin Name	Common name	On EPBC list of box gum plants	On EPBC list of important plants	Rehwinkle significance category
<i>Hydocotyle laxiflora</i>	Stinking Roger	Y		2
<i>Hypericum gramineum</i>	Native St John's Wort	Y	Y	2
<i>Indigofera adesmiifolia</i>	Tick Bush	Y	Y	2
<i>Juncus australis</i>				c
<i>Juncus homalocaulis</i>		Y		
<i>Juncus subsecundus</i>	A Rush	Y		c
<i>Kunzea parvifolia</i>	Violet Kunzea	Y	Y	c
<i>Lepidospema laterale</i>		Y		2
<i>Leptorhynchos squamatus</i>	Scaly Buttons	Y	Y	2
<i>Lomandra bracteata</i>	Short-flowered Mat-	Y		1
<i>Lomandra filiformis</i>	Wattle Mat-rush	Y		1
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Y		1
<i>Lomandra multiflora</i>	Many-flowered Mat-	Y		1
<i>Luzulu densiflora</i>	Woodrush	Y		2
<i>Lythrum hyssoppifolia</i>	Hyssop Loosestrife			c
<i>Microlaena stipoides</i>	Weeping Grass	Y		c
<i>Microtis parviflora</i>	Slender Onion Orchid	Y	Y	2
<i>Microtis unifolia</i>	Common Onion Orchid	Y	Y	2
<i>Omphacomeria acerba</i>				
<i>Oxalis perennans</i>	Grassland Wood Sorrel	Y		c
<i>Panicum effusum</i>	Hairy Panic	Y		c
<i>Pimelea curviflora</i>	Curved Rice-flower	Y	Y	2
<i>Pimelea glauca</i>	A rice-flower	Y	Y	2
<i>Plantago varia</i>	Native Plantain	Y	Y	2
<i>Poa sieberiana</i>	Poa Tussock	Y		c
<i>Pseudognaphalium luteo-</i>	Jersey Cudweed	Y		c
<i>Pterostylus sp</i>	A greenhood orchid			2
<i>Rumex brownii</i>	Swamp Dock	Y		c
<i>Schoenus apogon</i>	Common Bog Sedge	Y		c
<i>Senecio quadridentatus</i>	Cotton Fireweed	Y		c
<i>Senecio hispidulus</i>	A fireweed	Y		c
<i>Solanum cinereum</i>	Nawarra Burr			2
<i>Solenogyne dominii</i>	Smooth Solenogyne	Y	Y	c
<i>Swainsona sericea</i>	Swansons silky pea	Y	Y	2
<i>Themeda australis</i>	Kangaroo Grass	Y	Y	2
<i>Tricoryne elatior</i>	Yellow Rush Lily	Y	Y	2
<i>Vittadinia cuneata</i>	Fuzzy New Holland	Y		c
<i>Vittadinia muelleri</i>	Narrow-leaf New	Y		c
<i>Wahlenbergia communis</i>	Tufted Bluebell	Y		c
<i>Wahlenbergia luteola</i>	Yellowish Bluebell	Y		c
<i>Wahlenbergia stricta</i>	Tall Bluebell	Y		c
<i>Wurmbea dioica</i>	Early Nancy	Y	Y	2