

THE HUGHES GARRAN WOODLAND MANAGEMENT PLAN

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The mown walking tracks have greatly increased the local community's use of the Woodland.



ACT
Government



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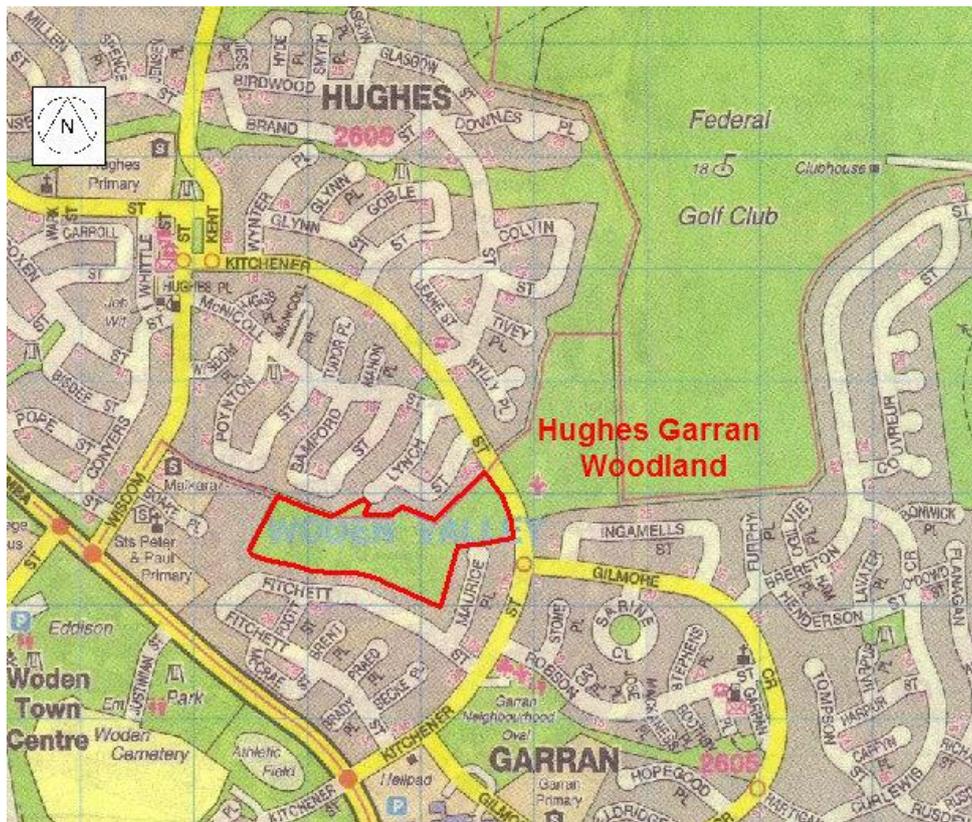


Figure 1. Locality of the Hughes Garran Woodland

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HUGHES GARRAN WOODLANDS

- a draft Management Plan

Summary

This draft plan has been produced by consultants in collaboration with the land owner and the volunteer group contributing to the management of the Woodland. Funding was provided by the ACT Government's Environment and Sustainability Directorate.

The eight hectare Woodland is linked to the Red Hill Nature Park and shares many of its features. It is bordered by the suburbs of Hughes and Garran with the Southern Cross Retirement Village at the western end and Kitchener Street to the east. The original landscape was yellow box-red gum grassy woodland but about a century of grazing and the development of the adjoining suburbs has substantially modified that landscape. Fortunately, in 1965 much of the Woodland was planted up with trees common to the area, eg yellow box, apple box and Blakely's red gum, providing a basis for re-establishing the Woodland. The original understorey was largely destroyed and much of the original wildlife has probably been severely reduced.

The immediate objective of managing the Woodland is to provide a recreational amenity for the local community; it is not a Nature Park. In the longer term, however, the aim is to restore the area to a diverse box-gum grassy woodland.

The consultants anticipate a number of matters that need to be addressed, these include:

- The invasion of weeds including introduced woody weeds; grass and broad leaved weeds dominate the ground cover.
- Opening up some of the densely planted stands to provide a woodland landscape.
- Enhancing an area of native forbs and grasses at the western end of the park.
- Enhance bird life by re-establishing an understorey and the provision of bird boxes.
- Maintenance of the Woodland to ensure safe access for its users and the protection of the Woodland and surrounding houses from fire.
- Monitoring changes to the park over time.

The area has been mapped to show the vegetation and natural features as well as access roads and walking tracks. The Woodland was divided into five Management Units (MUs) according to their different requirements, their boundaries being defined by service roads and walking tracks.

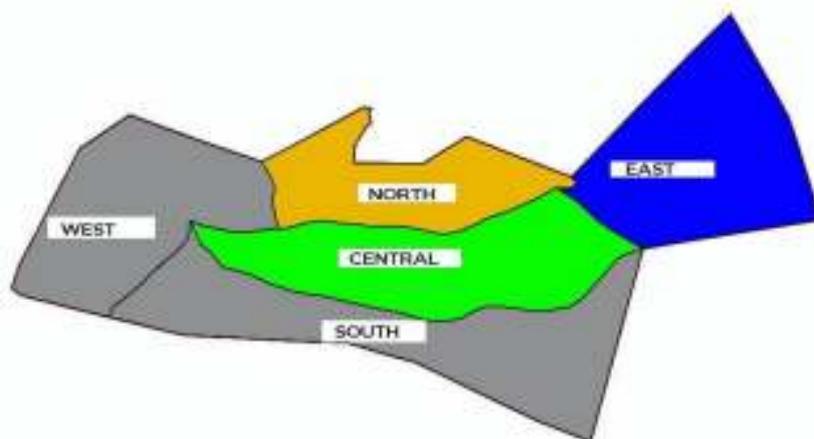


Figure 2. The division of the Woodland into management units is central to the proposed management of the Woodland. Each colour is managed differently, according to the features of the site.

The Plan prescribes the activities that both the Hughes Garran Woodland Group (HGWG) and the ACT Government have agreed to undertake in each of the Management Units over a period of ten years. The implementation of the plan will be via a rolling program approved annually by the volunteer Group and the ACT Government.

When approved, the Plan will represent an aspirational works program, dependent on available resources. It is a guide for the parties involved, not a formally binding agreement. Proposed works by HGWG cannot be passed onto other groups or other individuals without agreement from TAMS.

Introduction

The Hughes Garran Woodland

The Woodland is 'semi-natural open space' (Block 54, Section 8, Hughes) of approximately 8 hectares. It is bordered by the suburbs of Hughes to the north and Garran to the south and east. Kitchener Street delineates the north eastern end and the Southern Cross retirement village the western border. It is located along a ridge connected to Red Hill and is described as remnant yellow box-red gum grassy woodland.

Since European settlement in the 1860s until the mid 1960's the area was grazed. It was held as a grazing lease by Charles C. Russell from the 1930s until the mid 1960s when the area was designated for urban settlement – the first houses built in the Woden Valley.

As indicated by Figure 3, the original woodland had been seriously depleted by this point in time; only three or possibly four original trees can now be identified in the park. However, in 1965 much of the area was planted up to a number of eucalypt species many of which – but not all – were appropriate to the site. From 1965 the Woodland has been maintained by the ACT Government, largely by mowing the boundaries and occasionally prescribed burning of the area. In 2003, a Landcare Group was established to improve the amenity and ecological values of the park. Some tree planting and woody weed control, the latter largely by the Conservation Volunteers of Australia, was undertaken. A combination of drought and a control burn in 2007 resulted in considerable damage to many of the trees. In 2011 the level of activity was increased; walking tracks were cut through the Woodland to improve access and further plantings of trees and shrubs occurred.



Figure 3. An aerial photograph of the 'new' suburb of Hughes taken in 1963 shows the barrenness of the site and the few trees present at the time. Part of the Hughes Garran Woodland is at the base of the photograph (Canberra Weekly 15 Nov 1963).

Community use and participation

The Woodland is used as both a thoroughfare and for recreation. Both children and adults pass through the park to shops and business premises and the three schools in proximity to the park. But since the establishment of the walking tracks it is increasingly used for recreation, with people walking through the Woodland rather than around it.

It is proposed that this report be provided to the ACT Government and the Hughes Garran Woodland Group for their input. Comment on the Working Plan will be sought from residents inside the Kitchener Street, Wisdom Street, Yamba Way loop, by circulating the Summary together with advice that the full report is accessible on line. Finally the land owner (ACT Government) and the volunteer group (the Hughes Garran Woodland Group) must sign off on the Plan. Permanent and/or temporary signage could be erected to further encourage local community participation in the Group's activities subject to approval by TAMS.

The consultancy

In 2011 the Hughes Garran Woodland Group obtained a small grant from the ACT Government's Environment and Sustainability Directorate to develop a Long Term Management Plan for the Woodland. The aim of the Working Plan is to seek a better understanding of the history, community use and the ecology of the Hughes Garran Woodland, and to document an agreed approach to its management. Key stakeholders are the ACT Government (the land owner) and the Hughes Garran Woodland Group.

Local consultants were engaged to develop the draft Plan. Mr Tony Fearnside is an urban forestry consultant with significant experience in forest and bushfire management; Ms Sarah Sharp is a consultant plant ecologist specialising in the conservation of lowland ecosystems in the ACT and surrounding region; Mr Jim Shirley is a professional forester specialising in forest assessment and mapping. Both Tony and Jim participated as members of the Friends of ACT Arboreta. The consultancy has set out to capture the following key elements:

- Document the current status of the Woodland, in particular:
 - The ecology of the Woodland
 - Fire management
 - General management issues/considerations
 - Establishment of Management Units
- Develop a Management Plan for the respective Management Units.

The Management Plan was firstly approved by the Hughes Garran Woodland Group and the draft Management Plan was then circulated to the local Hughes and Garran Communities. The amended draft was then passed to the ParkCare and Volunteer Coordinator for comment by the Department. This document contains those amendments.

Once approved by the key stakeholders, the Long Term Management Plan will provide the focus and direction for future planned activities for the Hughes Garran Woodland volunteer group.

Characteristics of the Woodland

Mapping

An aerial photograph captured by Nearmap (<http://www.nearmap.com/>) in September 2011 was spatially registered in GIS software, using coordinates determined in Google Earth. Positional accuracy is approximately +/- 10m. The outer edges of individual tree canopies were digitized from the image, where they could be distinguished, and labelled with species common names after field verification. Other vegetation types, such as areas of kangaroo grass and newly planted areas were added from field sketches. Surface rock was plotted. Finally, physical features such as walking tracks, access points and boundary fence-lines were digitized from the photograph.

Maps of the Woodland and the individual Management Units (pages 17 to 33) were prepared as the basis for establishing the MU's.

Classification of the vegetative cover (Figure 24, page 46) was achieved by intersecting the tree crowns with a 30m x 30m square grid. The percentage of each grid covered by tree crowns was estimated and each grid classified on the basis of Australian Bureau of Agriculture Resource Economics and Sciences' crown cover classification. This classification is as follows:

- Closed forest 100 to 81% cover
- Open forest 80 to 51%
- Woodland 50 to 31%
- Grassland < 30%

Soils

Two or three small soil pits were dug in each Management Unit; results are presented in Appendix 2, page 47. The results indicate that apart from the incidence of rock in several Management Units (particularly the West MU and the eastern end of the South MU), the soils are relatively good; with the A1 horizons 8 to 20cm, A2 horizons 25 to 70cm deep. 'A' horizon textures were mostly sandy loams, B horizons red or occasionally yellow red clays. The South MU had a particularly deep and moist A horizon supporting a vigorous cover of couch grass as well as established and newly planted trees. The vegetation suggests the gully part of this MU can be wet for part of the year.

Ecology

Vegetation: The Hughes Garran Woodland is a substantially modified remnant of yellow box-red gum grassy woodland (Appendix 3, page 48). Indigenous species within the park include yellow box (*Eucalyptus melliodora*), Blakely's red gum (*E. blakelyi*), red box (*E. polyanthemos*) and apple box (*E. bridgesiana*). Only three or four trees in the Park are original, and are probably very old (more than 200 years). There is a considerable loss of native diversity, with extensive clearance of trees at some time in the past, and there has also been a significant loss of native herbaceous plants. There has been extensive tree planting, mostly in 1965. Some of the trees that have been planted are not indigenous to the ACT (eg ironbark (*Eucalyptus* sp.), Argyle apple (*E. cinerea*), blue gum (*E. bicostata*), willow-leaved peppermint (*E. nicholli*), or are unlikely to have been present in this woodland prior to disturbance, eg brittle gum (*E. mannifera*). Nevertheless, some are suited to the site and provide habitat for a range of species. Much of the earlier tree planting is closely spaced and has formed a closed canopy, adversely affecting the midstorey and the natural regeneration of trees.

The midstorey is dominated by acacias, including green wattle (*Acacia mearnsii*) and occasional *Cassinia* species and *Grevillea* species.

A plant species list is presented in Appendix 4, table 10, page 50. The list also includes species that have been planted. Further surveys of the plants in each of the Management Units are recommended, including more quantitative surveys to determine the condition of the woodland in each unit. The ground layer is typical of a site that has had considerable disturbance following the establishment of the residences in the surrounding area. It is very likely that the park was dominated by native ground layer species, possibly with a high diversity of species, prior to the establishment of the suburbs, even though grazing would have been undertaken prior to that.

Tree health: The control burn under drought conditions in 2007 killed about 80 trees and caused massive damage to most of the remaining trees to the point where many are likely to die. The dead bark still in place around the lower bole and the accumulated debris in the coppice of many living trees will increase the risk that the next control burn kills these trees. Consideration needs to be given as to how best to protect the already damaged trees and to prevent damage to the remainder.



Figure 4. The impact of fire and drought on the 1965 plantings of yellow box. *Left:* Fire-killed trees coppicing from the base. *Right:* The flaky bark on the lower trunk results in the tree being effectively ringbarked, even by a mild burn. Accumulated bark around the base of the tree has been removed.

Weeds: A high level of disturbance has resulted in a high cover of introduced species, including the invasive Chilean needlegrass (*Nassella neesiana*) and African lovegrass (*Eragrostis curvula*), spread by mowers, people and animals. Other weeds include St John's wort (*Hypericum perforatum*), blue periwinkle (*Vinca major*), blackberry (*Rubus fruticosus*), perennial couch (*Cynodon dactylon*) and the annual grass, wild oats (*Avena* spp.), which is likely to have invaded as a result of soil disturbance and mowing. The rocky outcrops have retained a higher component of native species, because they have been disturbed less by mowing and other machinery. The Eastern Management Unit is predominantly covered by a low diversity of native species (mostly grasses, but including some other herbaceous species), except for some patches which are invaded by exotic species, including Chilean needlegrass.

Weeds are the greatest threat to both amenity and ecological values in the park. Threats include:

- Increased cover of woody weeds including wattle (both local and introduced) limiting diversity of ground layer species and creating a fire fuel hazard.
- Replacement of native species by more invasive species (especially Chilean needlegrass and African lovegrass).
- Increased fire hazard by annual species which die in summer (especially wild oats).

Weed Management Plan. The group should provide TAMS through the Park Care and Volunteer Coordinator with a seasonal Weed Management Plan for approval including chemicals and equipment.

Declared pest plants present in the park are Chilean needlegrass (CNG), African lovegrass (ALG) and Cootamundra wattle. In addition, there are other less invasive weeds that are a fire fuel threat (including wild oats and woody weeds). Where it is dominant wild oats is a strong competitor and effectively prevents many native species from establishing. Other weeds reduce the amenity of the park (including woody weeds, mullein, horehound, fleabane, milk thistle and mustard weed).

The environmental weed danger rating of some **declared pest plants** in Hughes Garran Woodland is presented in Table 1. The rating is taken from ACT Parks and Conservation Service (2011).

Table 1. Environmental weed danger rating of some Hughes Garran Woodland weeds.

| Environmental weed danger rating | Extreme | Very high | High | Moderate |
|----------------------------------|--|-----------|--------------------|----------|
| Species | Chilean needlegrass African lovegrass | | Cootamundra wattle | |

Remnants of a number of woody weeds – mostly escapes from domestic gardens – remain but these have largely been controlled by the volunteers. These include nettle tree (*Celtis australis*), cotoneaster (*Cotoneaster* sp.), black locust (*Robinia pseudoacacia*), oak (*Quercus* spp.), plum (*Prunus* sp.) and claret ash (*Fraxinus* sp.). Since the control burn in 2007, green wattle (*Acacia decurrens*) and Cootamundra wattle (*A. baileyana*) have proliferated in separate parts of the park. A list of introduced species and weeds in the Woodland is given in Table 2 below, and Table 10, page 50.

Table 2. Weeds observed in Hughes-Garran Woodland (not complete).

| | Exotic weeds | Native “weeds” |
|---------------------|--|---|
| TREES | Pistacia (<i>Pistacia sinsensis</i>) – autumn colour Cotoneaster (<i>Cotoneaster</i> sp.) Nettle tree (<i>Celtis australis</i>) Black locust, false acacia (<i>Robinia pseudoacacia</i>) Firethorn (<i>Pyracantha</i> sp.) Radiata pine (<i>Pinus radiata</i>) Tree of heaven (<i>Ailanthus altissima</i>) Various <i>Prunus</i> spp. Purple-leaved prune (in leaf) Privet (<i>Ligustrum</i> spp.) | Sydney bluegum Cootamundra wattle Other wattles |
| SHRUBS | St John’s wort Black berry Scotch broom (<i>Cytisus</i> sp.) | Cootamundra wattle |
| GROUND COVER | BROADLEAFED - Many, eg Vinca (<i>Vinca major</i>) various clovers, glycine various Brassicas various flowers, eg marigolds, irises Aaron’s rod (<i>Verbascum</i> sp.) Proliferous pink (<i>Petrorrhagia prolifera</i>) Salsify (<i>Tragopogon</i> sp.) Sheep’s Burnett (pasture weed) GRASSES - Many, eg Wild oats Winter grass Kikuyu Chilean needlegrass African lovegrass Milk thistle Thistles Fleabane | BROADLEAFED |

CNG can be sprayed in winter to minimise off-target damage to neighbouring warm season native grasses; glyphosate or fluoproponate can be used. ALG is a warm season grass so spray from spring to autumn, fluoproponate is the best herbicide for control. Many evergreen woody weeds are relatively easy to see, eg wattles, blackberry, vinca. Some are obvious when they flower, eg St John’s wort, iris, marigolds. Other are obvious when they have autumn colours eg *Pistacia*. In the growing season some have coloured leaves, eg purple-leaved plum. Following is a weed control calendar (Table 3).

Table 3. Weed Control Calendar (prepared by the Molonglo Catchment Group)

| | | Molonglo Catchment Group Weed Information Pack | | | | | | | | | | | | | | | |
|--|--|--|--------|--------|--------|-----------|------|--------------------|------|-----------|------|--------------------|-----------|------|--------------------|-----------|------|
| | | WEED CONTROL CALENDAR | | | | | | | | | | | | | | | |
| Common Name | | The following calendar provides a seasonal overview of the control options available for each species in the Molonglo Catchment Priority Weeds List. It can be used as a quick reference guide to plan your management activities throughout the year. Refer to the individual weed fact sheets for detailed information about how to implement controls. If you require assistance in weed management planning contact your local council or Parks, Conservation and Lands ACT. | | | | | | | | | | | | | | | |
| | | CONTROL METHODS/SEASON | | | | | | | | | | | | | | | |
| | | Summer | Autumn | Winter | Spring | Hand pull | Fire | Cut and chemically | Fire | Hand pull | Fire | Cut and chemically | Hand pull | Fire | Cut and chemically | Hand pull | Fire |
| African boxthorn | | | | | | | | | | | | | | | | | |
| African lovegrass | | | | | | | | | | | | | | | | | |
| Blackberry | | | | | | | | | | | | | | | | | |
| Broom spp (Cape/ Montpellier & Scotch/English) | | | | | | | | | | | | | | | | | |
| Burrs (Noogoona & Bathurst) | | | | | | | | | | | | | | | | | |
| Chilean needle grass | | | | | | | | | | | | | | | | | |
| Cootamundra wattle | | | | | | | | | | | | | | | | | |
| False acacia / black locust | | | | | | | | | | | | | | | | | |
| Fireweed | | | | | | | | | | | | | | | | | |
| Gorse | | | | | | | | | | | | | | | | | |
| Hawthorn | | | | | | | | | | | | | | | | | |
| Horehound | | | | | | | | | | | | | | | | | |
| Paterson's curse & viper's bugloss | | | | | | | | | | | | | | | | | |
| Pine (Monterey / Radiata) | | | | | | | | | | | | | | | | | |
| Poplars (White & Lombardy) | | | | | | | | | | | | | | | | | |
| Privet | | | | | | | | | | | | | | | | | |
| Serrated tussock | | | | | | | | | | | | | | | | | |
| St John's wort | | | | | | | | | | | | | | | | | |
| Sweet briar / briar rose | | | | | | | | | | | | | | | | | |
| Thistles (Scotch / Illyrian & Nodding) | | | | | | | | | | | | | | | | | |
| Tree of heaven | | | | | | | | | | | | | | | | | |
| Willows (except weeping - Salix babingtonii and two types of pussy willow - S. v. roosei and S. v. californiana) | | | | | | | | | | | | | | | | | |



Birds and other fauna: Bird species that have been observed at a nearby residence are listed in Table 4. Planting species such as bottlebrushes (*Callistemon* spp.) attract birds, but generally only larger birds. By enhancing habitat for invertebrates (shelter and food) a wider range of bird species are attracted to an area, particularly small woodland birds. This can be achieved by planting indigenous native species and providing other habitat such as fallen timber (Taws, 2003), subject to the Fire Management Unit's approval. Efforts will be made to contain the spread of feral birds, ie Indian mynas and feral pigeons. We have been advised by the Indian Myna Action Groups that there are 45 traps in Hughes alone and there is little evidence of a problem.

It is unknown what other native fauna occur in the park, but it is likely to be inhabited by possums and small lizards. It is likely that cats (domestic and wild) inhabit the park, and that foxes are also present. However, it is not likely that either can be controlled successfully.

Table 4. Birds observed at Lynch Street, Hughes, 1970-2012.

| Australian birds | | Exotic birds |
|--|--|-------------------------|
| Sulphur-crested cockatoo | Pardalotes (feed on lerp insects etc; nest in garden soil) | Black birds |
| Eastern rosella | Tufted or crested pigeons | Starlings |
| Crimson rosella | Spotted turtle dove (looks like a spotted pigeon) | Indian mynas |
| Australian king parrot | Robins | Feral pigeons |
| Galahs | Blue wrens | Sparrows- house sparrow |
| Gang-gangs | Silver eyes | |
| Superb parrots (a pair for 2 weeks) | Thornbills | |
| Red rump parrot (often mistaken for the superb parrot) | Finchs – zebra finch | |
| Some green lorikeets | Apostle birds | |
| Some green and blue parrots | Currawongs | |
| Cuckoos | Choughs | |
| Owls | Magpies | |
| Red wattlebird, other wattlebirds | Crows/ravens | |
| Friar birds | Wild ducks (with ducklings) | |
| Noisy miners | 2 visits several years apart | |
| Kookaburras | | |
| Mudlarks | | |
| Willie wagtails | | |

Microhabitat characteristics that are important for fauna of the box-gum woodland include:

- Hollow-bearing trees (five trees only).
- Emergent/standing dead trees.
- Fallen timber and logs.
- Structural complexity.
- Mosaic habitat.
- Rocky outcrops.
- Connectivity.

The Woodland is connected at its eastern end to the Red Hill Nature Reserve, via a scattered woodland and planted areas within the Royal Golf Club. While the link would be tenuous for many species, some birds would be likely to move between the Woodland and the Red Hill Reserve.

Restoration of the Woodland – a model

The existing trees, shrubs and to a lesser extent, the ground cover, provide a good basis for restoring the Woodland to something approximating the original landscape and habitat. To achieve this, future plantings should focus (but not exclusively) on the core elements of the yellow box-red gum grassy woodland which are shaded in the **Recommended Planting List** (Table 6, page 35). A typical yellow box-Blakely's red gum open grassy woodland is described below (adapted from Environment ACT 2004). This can be used as a model for restoration of the Woodland, one that is unlikely to be fully realised but which provides a goal.



Figure 5. A yellow box-red gum grassy woodland. Components of an unmodified woodland would include a few, scattered mature trees, regenerating trees of different ages, an understorey of shrubs 1-2 metres high, and ground cover including tussocks, grasses and forbs (ACT Government).

Dominant tree species: Yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*E. blakelyi*) are the dominant tree species in the ACT. Common eucalypt associates are apple box (*E. bridgesiana*), brittle gum (*E. mannifera*), scribbly gum (*E. rossii*) and red stringybark (*E. macrorhyncha*). Other trees and tall shrubs include cherry ballart (*Exocarpus cupressiformis*), silver wattle (*Acacia dealbata*), black wattle (*A. mearnsii*) and hickory wattle (*A. implexa*). Open woodlands have a canopy tree cover of approximately 20%, which equates to approximately 10 mature trees per hectare. Some of the plantings in the Woodland are as high as 300 trees per hectare.

Mid-stratum: Shrubs and sub-shrubs less than 0.5m tall include bitter cryptandra (*Cryptandra amara*), urn heath (*Melichrus urceolatus*) and shrubby rice flower (*Pimelea glauca*). Shrubs occur more frequently on higher slopes as the community merges into forest, and within areas that have been disturbed (eg by fire); acacias may be temporarily common. Regenerating eucalypt seedlings and saplings form a midstorey, particularly after cessation of grazing, when they may form thickets.

Groundlayer: The groundlayer is dominated by native tussock grasses and a high diversity of native forbs (herbaceous non-grass species). The dominant grasses are kangaroo grass (*Themeda triandra*), spear grasses (*Austrostipa bigeniculata* and *A. scabra*), wallaby grasses (*Rhytidosperma*¹ species) and tussock grass (*Poa sieberiana*). Many families of plants are represented in the woodlands, including

¹. Wallaby grasses have been recently reclassified at the genus level: *Austrodanthonia* species are now *Rytidosperma* species (Lepschi *et al.* in press).

daisies, sedges, lilies and orchids. Many native forbs are only found in woodlands that have been subject to lower levels of disturbance, particularly the use of fertilisers and/or ploughing. In the ACT all remaining box-gum woodland contains introduced species, ranging from **declared pest plants** such as St John's wort (*Hypericum perforatum*) to less competitive but widespread species such as flatweed (*Hypochaeris radicata*) and common centaury (*Centaurium erythraea*).

Habitat: Box-gum woodland provides habitat for a wide diversity of birds, bats, invertebrates and arboreal mammals. Important habitat features include hollows of all sizes, dead standing trees, thickets of trees and shrubs, rocky outcrops and loose rocks, fallen timber, fine litter, open grassy areas and wet areas (creeks, drainage lines, dams and springs).

Native fauna and flora: Large areas of woodland in relatively good condition support a greater number of threatened species (and other species), than more modified woodland areas. However, birds and other mammals are often highly mobile, and utilise a variety of areas, and thus may be found only sporadically in any particular area. Species utilise different parts of the landscape. For example, hooded robin require large trees for protective cover, areas of grass that support insects and other invertebrates, perching sites within grassy areas and trees and shrubs for sites for nesting. Brown treecreepers require relatively undisturbed grassy woodland with native understorey, large living and dead trees and fallen timber as foraging habitat.

All these characteristics can be enhanced within the Hughes Garran Woodland through restoration. It is recommended that some standing dead trees be retained as these provide important habitat. As such trees may be safety hazards; expert advice should be obtained on how to manage the dead and dying trees in the Park. Thickets of acacias provide habitat for a range of species, and in select locations such thickets should remain. They will naturally thin over time.

Bushfire management

The ACT Government's fire management strategy has been to manage fuel levels by a combination of regular slashing or mowing and fuel reduction burning at five to six year intervals.

Situation: The Garran Hughes Woodland is aligned in a NNW – SSE direction which is the wind direction associated with the most damaging (severe, extreme and catastrophic) bushfire conditions. It is possible to imagine that a fire lit under such conditions at the NW corner would burn very quickly through the whole parkland and threaten houses and property at the SE side, ie, the NE part of Fitchett Street and Maurice Place. However the chances of this happening are low, particularly as there is no "wick" to open areas to the NW.

Under milder conditions, it can be expected that fire crews would be quickly on the scene to control fires, **unless there is a multiple fire situation**. Provided that the vegetation is not allowed to become overgrown, the risk of damage to privately owned property is low under mild bushfire conditions. The bare earth service tracks on all sides of the parkland would be more effective if the breaks alongside the service tracks were mowed as scheduled (on the western boundary there is a concrete path). This would help to prevent fires on the woodland damaging private property.

Recent fire history: In 2003 the ACT Government undertook fire fuel reduction activities which included the removal of dead trees and shrubs, trees under power lines, woody weeds and approximately 20 self-sown pine trees. There was also a general pruning and removal of rubbish.

Unusually, the burning carried out under the above strategy led to the deaths of a number of yellow box trees following burning in 2007. This was during a prolonged drought period when there were accumulations of dry bark at the bases of the trees and bark on the lower trunks was very dry. When burnt, the trees were effectively ringbarked, with many deaths followed by regeneration from coppice shoots. These are mainly in the eastern end of the Northern and Central Management Units.

There is no known history of unplanned fires apart from fires that were started by children several years ago. These were small and did not cause any damage to property.

Current bushfire management strategy: During the preparation of this plan, officers from the Territorial and Municipal Directorate visited the parkland and modified the fire management strategy which is summarised in Table 5 below.

Table 5. Summary of current fire management strategy

| Management Unit | Burning | Slashing | Remarks |
|-----------------|--|---|--|
| WEST | 2012-13 and then at 5-6 year intervals | Boundaries by ACT Govt. Walking track boundaries by HGWG. | Burning is expected to benefit the kangaroo grass. HGWG to protect recent plantings. |
| NORTH | No burning | Boundaries by ACT Govt. Walking track boundaries by HGWG. | HGWG to reduce fuel loadings and widen fire breaks to 15m. |
| CENTRAL | No burning | None by ACT Govt. Walking track boundaries by HGWG. | Minimum disturbance area. |
| SOUTH | 2012-13 and then at 5-6 year intervals | Boundaries by ACT Govt. Walking track boundaries by HGWG. | HGWG to protect recent plantings. |
| EAST | No burning | Whole area slashed by ACT Govt. | Slashing only. |

This strategy will allow for the development of an understorey in the Central Management Unit which will be an enhanced habitat for wildlife, especially birds.

There are some recent plantings within the Management Units to be burnt. These will require protection by the Group for several years at least if they are to survive a fire.

The areas to be slashed for bushfire mitigation are adjacent to houses. Slashing is likely to spread weeds, especially Chilean needlegrass and African lovegrass, and result in high cover of wild oats.

It is noted that this strategy pays no regard to assessing and reducing fire hazards in gardens or fences adjacent to leased land (ie, outside the fire breaks formed by mowing or slashing beside the service roads.

Risk: The above strategy does not entirely remove the risk of damage from bushfires (a residual risk will remain) but the risk will be kept down to an acceptable level provided that the strategy is effectively applied.

Walking tracks and service roads

The establishment of a number of walking tracks through the woodland has had a major impact on park usage (Figure 5 below). The tracks also facilitate the division of the Woodland into a number of Management Units (MUs), allowing for the more appropriate management of different parts of the Woodland. It has involved mowing the tracks with equipment provided by the Group and removing midstorey (mostly wattles) from five metres on either side of the track to improve security.

The service roads surrounding the Woodland are maintained by the ACT Government. The location of the service roads and walking tracks are shown on the maps of each MU on pages 19, 22, 25, 28 and 31.

Erosion and disturbed ground: Serious erosion is occurring on the service road behind Bamford St. Most of the walking tracks are stable although the one down the western face of Hawk Hill is showing signs of erosion as is the track from the top of the kangaroo grassland (West MU) down slope in a north westerly direction (Sharp 2011).

Rubbish: Adjacent residences, occasionally dump vegetative or other waste, or extend their gardens outside properties. This may require the dissemination of information to residents by the ACT Government. Such activities can result in the spread of garden plants into the park, restrict the ability of slashing of boundaries for fire hazard reduction and in themselves may increase fire fuel hazard.



Figure 6. A walking track along the boundary between the South and Central Management Units.