



Ken Hurst Park Management Plan

August 2003



— City of —
Melville

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 Purpose and Scope	1
1.2 Location and Land Use	1
1.2.1 Land Use Zoning.....	2
1.2.2 Surrounding Land Uses.....	2
1.3 Relevant Studies and Existing Information	2
1.4 Roe Highway Stage 7.....	2
2. BIOPHYSICAL AND SOCIAL ENVIRONMENT	4
2.1 Climate.....	4
2.2 Soils and Landform.....	4
2.3 Hydrology	4
2.3.1 Surface Hydrology	4
2.3.2 Groundwater	5
2.4 Vegetation and Flora Assessment.....	5
2.4.1 Assessment Methodology	5
2.4.2 Vegetation Complexes and Types	6
2.4.3 Floristic Community Types	7
2.4.4 Vegetation Condition	8
2.4.5 Greenways.....	9
2.4.6 Conservation Value of the Vegetation.....	9
2.4.7 Flora	10
2.4.8 Significant Flora.....	10
2.4.9 Dieback	11
2.5 Vertebrate Fauna.....	12
2.5.1 Habitat.....	12
2.5.2 Native fauna	12
2.5.2 Significant Fauna	13
2.5.3 Pests	15
2.6 Recreational, Educational and Heritage Values.....	15
2.6.1 Recreational Value.....	15
2.6.2 Existing Facilities & Infrastructure.....	15
2.6.3 Educational Value	15
2.6.4 Aboriginal Heritage	16
2.7 Community Consultation.....	16
3. MANAGEMENT DIRECTIONS.....	19
3.1 KHP Values	19
3.2 Management Vision.....	19
3.2.1 Vision.....	19
3.2.2 Goals	20
4. CONSERVATION MANAGEMENT	21
4.1 Principal Conservation Direction.....	21
4.2 Vegetation and Flora.....	21
4.3 Invasive Weeds	22

4.4	Native Fauna	23
4.5	Pests	24
4.6	Disease Management	26
4.7	Wetland Management	27
4.8	Fire	28
4.9	Litter Management	29
4.10	Management of Roe Highway Interface	30
5.	RECREATION AND ACCESS MANAGEMENT	31
5.1	Principal Recreation Direction	31
5.2	Access Controls	31
5.2.1	Pedestrian Access	31
5.2.2	Vehicle and Motorbike Access	31
5.2.3	Fencing	32
5.2.4	Gates	33
5.3	Car Parking	34
5.4	Signage	34
5.5	Interaction with the Community & Other Organisations	34
6.	RESEARCH & MONITORING	36
6.1	Principal Research & Monitoring Directions	36
6.2	Research & Monitoring	36
7.	IMPLEMENTATION	38
7.1	Prioritisation of Management Proposals	38
7.2	Cost of Implementation	42
7.3	Term of the Management Plan	43
	REFERENCES	44

LIST OF FIGURES

1. Regional Location
2. Topography and Wetland Mapping
3. Vegetation Associations
4. Vegetation Condition
5. Ken Hurst Park Management Plan 2003 - 2007

LIST OF APPENDICES

1. Flora List
2. Vertebrate Fauna List
3. Vegetation Condition Rating Scale
4. Minutes of Community Workshop
5. Control Guidelines for Weeds in Ken Hurst Park
6. Dieback Hygiene
7. Gate Specifications

1. INTRODUCTION

1.1 Purpose and Scope

The City of Melville is seeking to develop a 5-year comprehensive Environmental Management Plan based on the sustainability and long term protection, conservation and restoration of Ken Hurst Park (KHP).

The City of Melville endorsed the formulation of a concept plan for KHP in 2000. The concept plan sought extensive community liaison over a 12-month period to ensure that the park met the present and future needs of the community. Part of the process involved community aspirations for the park including management, land use and improvements to the park.

The purpose of this Management Plan is to provide a basis to guide the use and management of KHP over the next 5 years but also in the longer term. This Management Plan is a strategic document and it is envisaged that more detailed specific plans may be required prior to implementation (such as weed control plans, monitoring programs and vegetation rehabilitation plans).

The objectives of this Management Plan as outlined in the project brief are as follows:

- Ensure the long term conservation of the remnant bushland, develop wildlife corridors and significant habitat.
- Liase with all stakeholders including City of Melville, Main Roads, WA Government Railways, community and indigenous groups regarding the appropriate environmental management for the area.
- Restore and rehabilitate vegetation communities and ensure the long term viability of existing flora;
- Restore and rehabilitate vegetation communities and ensure the long term viability of existing flora;
- Establish a baseline environment data set and overall vegetation inventory for the City of Melville, which will act as a tool for environmental planning and management, and will also provide important information on the conservation status of vegetation communities in this reserve.

1.2 Location and Land Use

KHP comprises 52.7 hectares of bushland in the southern metropolitan suburb of Leeming, within the City of Melville (Figure 1). The park comprises remnant vegetation dissected by a standard gauge railway line. KHP is named after Mr Ken Hurst, Mayor of the City of Melville between 1971 and 1973.

1.2.1 Land Use Zoning

KHP is zoned 'Development' under the City of Melville's Community Planning Scheme No. 5 and 'Rural' under the Metropolitan Region Scheme.

1.2.2 Surrounding Land Uses

KHP is bounded to the south by the Jandakot Airport and to the north-east by the Regional Resource Recovery Centre and the City of Canning landfill site. A band of remnant vegetation separates the Park from the residential area of Leeming and forms the 'Important Regional Road' reservation of the proposed Roe Highway (Stage 7). John Connell Reserve is located to the north-west of the Park.

1.3 Relevant Studies and Existing Information

A number of biological studies have been conducted in KHP including a flora and vegetation survey by the Wildflower Society and a vertebrate fauna assessment by Dell and Cooper in 1992. In addition, Glevan was engaged by the City of Melville in 1999 to investigate the extent of Dieback in the Park.

According to members of the Friends of KHP, flora data for the Park is constantly being updated (Diana Corbyn, Eddy Wajon, pers comm. 2002), particularly in relation to populations of the Declared Rare Flora orchid, *Caladenia huegelii*.

More recently, the area of bushland to the north-west of the Park which forms the Roe Highway reservation has been the subject of several investigations initiated by Main Roads WA (MRWA) as part of the preparation of an Environmental Assessment and Management Plan for the Stage 7 alignment (ERM Mitchell McCotter, 1999). In particular, MRWA has undertaken a flora and vegetation survey (MRWA, 1998); dieback assessment (Hart, Simpson and Associates, 1998) and an archaeological and ethnographic survey of the highway alignment (Quartermaine Consultants, 1998a and b). An additional flora and vegetation survey of the Roe Highway alignment and north-west region of the Park was recently undertaken by Hart & Associates (2002) with the specific objective of locating the distribution and extent of the Declared Rare Flora species, *Caladenia huegelii*.

1.4 Roe Highway Stage 7

According to MRWA, the Roe Highway Reservation, extending from Welshpool Road to the Kwinana Freeway, has been set aside for the development of a Controlled Access Highway since 1963. The highway is being constructed in seven stages, with the final stage between South Street and Kwinana Freeway (ERM Mitchell McCotter, 1999).

Main Roads WA has recently received funding for the construction of Stage 7 and works are scheduled to commence in 2004. The final alignment of Stage 7 is subject to the outcomes of the Metropolitan Freight Network Review and environmental clearances, however according to Main Roads (D. Goble-Garrett pers comm. March 2003) the

preferred alignment is within the existing road reservation. The road is proposed to be a four lane carriageway initially, widening to six lanes when warranted by traffic growth.

According to the EAMP prepared for Stage 7, the existing plans for the highway indicate that it will be located along the northern side of the road reserve. This is likely to reduce the area of remnant vegetation to be cleared and ensure that it is retained in a single block rather than fragmenting it from KHP (ERM Mitchell McCotter, 1999).

2. BIOPHYSICAL AND SOCIAL ENVIRONMENT

2.1 Climate

The study area experiences a Mediterranean climate with cool wet winters and hot dry summers. The dry season generally extends from mid October to the end of March during which period the average maximum and minimum temperature range from 22.1°C to 31.5°C and 12.0°C to 17.7°C, respectively. The average maximum and minimum temperatures during the winter months range from 18.1°C to 25.3°C and 8.3°C to 13.9°C, respectively. The area receives up to 80% of its annual rainfall during the winter months from May to September with only 5% falling in December to March (Bureau of Meteorology, 2002).

2.2 Soils and Landform

KHP is underlain by Bassendean Sands of aeolian origin derived from the Bassendean Dunes geological unit. This system is characterised by low dunes with fine to medium grained quartz sands, white to grey at the surface and yellow at depths and sandy inundated or waterlogged interdunal swales.

Bassendean sands are generally leached and quite infertile although there are shallow accumulations of organic matter in the swales and depressions.

KHP slopes gently from two high points in the northern and south-western corner of the site to a low flat area in the central and southern region. The high points rise to 36m AHD with the low-lying area in the central and southern region varying between 26m and 28m AHD.

2.3 Hydrology

2.3.1 Surface Hydrology

No surface water drainage features occur in the Park. However the Wetland Atlas (Hill *et al.*, 1996) identifies two damplands, or seasonally waterlogged basins, partially located in the south-eastern region of the Park, as shown in Figure 2.

The northern dampland comprises a Paperbark (*Melaleuca preissiana*) Tall Open Scrub surrounded by a Closed Low Heath of *Regelia inops*, *Scholtzia involucrata*, *Hypocalymma angustifolium* and *Kunzea ericifolia*. The wetland is identified as a Resource Enhancement wetland in the Wetland Atlas and Bush Forever (Government of WA, 2000).

The dampland immediately to the south has been modified in places being dissected by tracks and vehicle access paths. The remaining vegetated sections comprise scattered Paperbarks with Swamp Banksia (*Banksia littoralis*), Christmas Trees (*Nuytsia floribunda*) and Jarrah (*Eucalyptus marginata*). The Wetland Atlas (Hill *et al.*, 1996) identifies this Dampland as a Conservation Category wetland. However more recent

documentation (ie Bush Forever) defines it as Resource Enhancement (Government of WA, 2000).

None of the wetlands in KHP are protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy, 1992.

2.3.2 Groundwater

The site is located to the north of the Jandakot Groundwater Mound (WAPC, 1998). The Priority 1 boundary of the Jandakot Mound is located approximately 500m to the south of Leeming Road.

Regional groundwater contour mapping of the area suggests average maximum groundwater levels lie at about 25m AHD over most of KHP (WRC, 1997). Based on this information the groundwater is expected to vary from 1m below the natural surface in the south-eastern region of the site and up to 11m below the surface in the upland regions.

The contours suggest groundwater flow is in a north-westerly direction.

2.4 Vegetation and Flora Assessment

2.4.1 Assessment Methodology

An assessment of the vegetation and flora of Ken Hurst Park was conducted by a botanist from ATA Environmental over two separate days between September 22 and October 11 2002. The timing of the survey allowed for the identification of annual and ephemeral species such as orchids and grasses. As the site was not readily accessible by 4WD vehicle, the survey was conducted by traversing the site by foot. All major landforms and vegetation communities were surveyed, as identified using a 1:4000 colour aerial photograph. The vegetation was described and mapped according to the structure and species composition of the dominant stratum using the system of Specht as modified by Aplin (1979).

All native and non-native plant species were recorded and vegetation types mapped. Notes were also taken on the condition of the vegetation.

A survey of the site was previously undertaken by the Wildflower Society of WA between September and December, 1992.

Prior to undertaking the survey, ATA Environmental undertook a search of CALM's Declared Rare and Priority Flora database to identify any Rare or Priority species potentially occurring in the study area. The search identified 7 species of Declared Rare Flora or Priority Flora (1 DRF taxa and 6 Priority listed taxa) that have previously been recorded from the vicinity of the Park (Table 1).

TABLE 1
Declared Rare and Priority Flora Recorded in the Vicinity of the Park

Species	Conservation Code	Location
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i>	P1	Gosnells, Jandakot, Mundijong
<i>Byblis lindleyana</i>	P2	Yule Brook, Cannington, Jandakot
<i>Caladenia huegelii</i>	R	Ken Hurst Park
<i>Dodonaea hackettiana</i>	P4	Wattleup, Thompson Lake, Jandakot, Kings Park
<i>Microtis media</i> ssp. <i>quadrata</i>	P4	Pinjarra, Jandakot
<i>Stylidium longitubum</i>	P3	Midland, Busselton, Jandakot
<i>Tripterococcus paniculatus</i>	P1	Canning Vale

2.4.2 Vegetation Complexes and Types

Ken Hurst Park comprises dryland and wetland vegetation representative of the Bassendean Central and South Vegetation Complex. According to Heddle (*et al.*, 1980), this Complex ranges from a Woodland of Jarrah-Sheoak-Banksia on the sand dunes, to a low Woodland of *Melaleuca* species and sedgelands on the low-lying depressions and swamps.

The dominant vegetation types recorded in the Park are summarised as follows:

Ridges

- B1 *Banksia attenuata*/*B. menziesii*/Sheoak (*Allocasuarina fraseriana*) Low Woodland. This *Banksia* dominated vegetation type to 7 m tall varies from Open Forest to Open Woodland over a dense to low open shrubland dominated by *Petrophile linearis*, *Bossiaea eriocarpa*, *Hibbertia hypericoides* and *Stirlingia latifolia* and is prominent on dunal ridges within the Park. *Eucalyptus todtiana* also occurs in this unit. This vegetation is the most prevalent found within the Park

Dune Slopes

- B2 *Banksia attenuata*/*B. menziesii*/*Allocasuarina fraseriana* Low Open Forest with scattered Prickly Bark (*Eucalyptus todtiana*)/Christmas Tree (*Nuytsia floribunda*). This transitional *Banksia* dominated vegetation type to 6 m tall ranges from Open Forest to Woodland over an Open Shrubland to dense Low Shrubland is prominent on the dunes slopes and swales. The understorey is dominated by *Jacksonia sternbergiana*, *Acacia pulchella*, *Xanthorrhoea preissii*, *Hibbertia subvaginata* and *Phlebocarya ciliata*. The vegetation is most prominent through the central portion of KHP, grading between the drier *Banksia* sp. woodland of the tops of dunes and damplands in the swales, with a denser overstorey than the B1 vegetation type and a reduced shrub layer.

Flats and Wetland Areas

- Ri Closed Low Heath of *Regelia inops*/*Scholtzia involucrata*/*Hypocalymma angustifolium*/Spearwood (*Kunzea ericifolia*) with scattered Paperbarks (*Melaleuca preissiana*). This vegetation type, which is up 1.5m in height, is associated with the low-lying dampland in the eastern section of KHP. Other associated species include *Dryandra lindleyana*, *Adenanthos obovatus* and *Dasypogon bromeliifolius* as well as several sedge species.
- Bi Holly-leaf Banksia (*Banksia ilicifolia*) Low Woodland. This vegetation type, to 5 m in height, is present in two small areas adjacent to the dampland in the southern section of KHP immediately south of the rail line. The Low Open Shrubland understorey associated with the woodland is dominated by *Regelia inops*, *Dampiera linearis*, *Platytheca galioides* and *Phlebocarya ciliata*.
- BlMpNfEm Mixed Open Woodland of Swamp Banksia (*Banksia littoralis*)/*Melaleuca preissiana*/Christmas Tree (*Nuytsia floribunda*) and Jarrah (*Eucalyptus marginata*). This mixed vegetation type, with an overstorey to 12 m in height, grades from very open woodland to woodland and is prominent through the central and southern portions of KHP that occur to the south of the rail line. Associated with the understorey area is Low Open Heath dominated by *Hypocalymma angustifolium* and *Pericalymma ellipticum* and sedgeland including *Lepidosperma angustatum*, *L. longitudinale*, *L. squamatum*, *Mesomelaena pseudostygia* and *M. tetragona*.
- Mp *Melaleuca preissiana* Tall Open Scrub. To 5 m in height, this vegetation type occupies a small area along the southeastern boundary of KHP, adjacent to the City of Canning's landfill site.
- MpBl *Melaleuca preissiana*/*Banksia littoralis* Low Open Woodland over *Xanthorrhoea preissii* Shrubland. This vegetation type, to 10 m in height, occurs over a small area along the southern boundary of KHP, and is associated with a shrubland dominated by *Xanthorrhoea preissii*, with scattered *Pericalymma ellipticum*, *Hibbertia stellaris*, *Daviesia physodes* and *Melaleuca lateritia*.
- BEuc Mixed Banksia/Eucalyptus Woodland. This vegetation type, which includes *Banksia attenuata*, *B. menziesii*, *Eucalyptus tottiana* and *Corymbia calophylla* to 15m in height, occurs in the southeastern corner of KHP. The understorey is relatively degraded through edge effects associated with the adjacent landfill site and as a consequence few native plant species occur.

2.4.3 Floristic Community Types

The Floristic Community Type study of vegetation on the Swan Coastal Plain (SCP) was developed by Gibson *et al.* (1994) and is based on an underlying concept that flora species occur in groups as a response to environmental factors and that defining such groups of species over the SCP would enable individual stands of vegetation to be

assigned to a group of sites with similar flora composition. In general, floristic community types comprise groups of flora that consistently occur together (Trudgen, 1995).

The floristic composition of the bushland at KHP belongs to the seasonal wetlands and upland vegetation centred on the Bassendean Dunes, that is the Super Groups 2 and 3 classification of Gibson *et al.* (1994), respectively.

According to Gibson *et al.* (1994), Group 2 is highly variable, having by far the largest number of community types which are more or less uniformly spread across the SCP. In general, this group has low species richness with weed frequency moderately high.

The flora group identified as Super Group 3 has the highest species richness and lowest weed frequency of major vegetation types on the SCP.

Under the Group 2 classification, the study area comprises the following Floristic Community Type:

- FCT 5 Mixed Shrub Damplands

FCT 5 has no consistent dominant overstorey. Dominants may include Holly-leaf Banksia (*Banksia ilicifolia*), Melaleuca preissiana, Actinostrobilus pyramidalis and Spearwood (*Kunzea ericifolia*). It generally has open ground and an open shrub layer and occurs in the Bassendean, Vasse, Herdsman and Beermullah land units.

Under the Super Group 3 classification, the study area comprises:

- FCT 23a Central *Banksia attenuata* – *B. menziesii* Woodlands.

FCT 23a is generally restricted to the Bassendean system ranging from Bullsbrook south to Woodman Point.

2.4.4 Vegetation Condition

Most of the bushland is in very good condition with smaller patches in the south-west and along the railway line in excellent or good condition. Several tracks dissect the Park, established as a result of uncontrolled access and lack of formally designated paths.

Invasive weeds such as Paterson's Curse (*Echium plantagineum*) and Geraldton Carnation Weed (*Euphorbia terracina*) are generally restricted to the periphery of the bushland and along the railway reserve. Rose Geranium (*Pelargonium capitatum*) extends along most of the southern boundary and is scattered along the edge of the rail reserve. Perennial Veldt Grass (*Ehrharta calycina*) occurs along the northern boundaries and is currently a fire hazard along the fence line of the adjacent houses (A. Thomson pers comm, 2002) (refer to Figure 5).

Rubbish dumping is a significant contributor to the spread of weeds and disturbance of the bushland at KHP. The Friends of KHP conducted a major clean-up of rubbish with the assistance of the City of Canning on 24 August 2002 and 18 May 2003. The City of Melville installed a gate across Dundee Street to prevent further rubbish dumping in the

Park, however an alternative path has been established around the gate and part of the fence has been cut away on the eastern side near the City of Canning landfill site (A. Thomson pers comm, 2002).

The condition of the bushland has been mapped according to the Bush Forever categories (Appendix 3) as shown in Figure 4.

2.4.5 Greenways

The site provides linkage to adjacent bushland to the north and south including Bush Forever Site 388 - Jandakot Airport, Jandakot. KHP forms part of Greenway 92 (Alan Tingay and Associates, 1998) which provides a fragmented linkage between regionally significant bushland and wetland areas (Government of Western Australia, 2000).

2.4.6 Conservation Value of the Vegetation

KHP has been recognised as comprising values of regional significance as part of the Bush Forever project. KHP (Bush Forever Site 245) meets a number of criteria for regional significance including representation of ecological communities, diversity, rarity, scientific or evolutionary importance and protection of wetland vegetation (Government of WA, 2000).

In particular, the Park encompasses a large (over 50ha) intact area of dryland and wetland vegetation representative of the Bassendean Central and South Vegetation Complex. The area supports habitat for a number of significant mammals including the Quenda and Western Brush Wallaby as well as the largest population of the Declared Rare Orchid, *Caladenia huegelii* in the Metropolitan Area with over 350 plants recorded from the Park to date (Eddy Wajon, pers comm, 2002). It is the combination of these factors which lead to its inclusion in Bush Forever.

A significant portion of the Bassendean Central and South Vegetation Complex has been cleared for the establishment of pine plantations and urban development. As a result, approximately 24% of the original distribution of this complex remains uncleared on the Swan Coastal Plain. While most of the Complex occurs south of the Swan River, a significant portion of the original extent of the Complex to the north of Perth is protected, or proposed for protection as part of Bush Forever (Government of WA, 2000) in the conservation estate. Other good examples of this Complex are found at Jandakot Airport (Bush Forever Site 388), Acourt Road Bushland, Banjup (Bush Forever Site 389), Wandi Nature Reserve (Bush Forever Site 347) and Modong Nature Reserve (Bush Forever Site 348). The implementation of Bush Forever will increase the reservation of this Complex on the Swan Coastal Plain from approximately 6% to 13%.

In terms of Floristic Community Types, Gibson *et al.* (1994) identified Type 23a and 5 as 'well reserved' and 'low risk'. That is, a significant area of these FCTs is in secure conservation reserves but sufficient remains uncleared to suggest that the floristic community type will in time be adequately protected through Government action. None of the Community Types present at the site are identified as Threatened Ecological Communities under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

2.4.7 Flora

A total of 280 species of flora (209 native, and 71 introduced flora) have been recorded from the study area during previous surveys undertaken by the Wildflower Society (1992) between September and December 1992.

A recent survey by ATA Environmental during late September and early October 2002 recorded a total of 240 species of flora, including 197 native and 43 introduced species (Appendix 1). The timing of the survey over this period was to maximise the opportunity for identifying as many species as possible from flowering material, particularly ephemeral species.

The minor discrepancy in the total number of species recorded can be attributed to the extended period and total number of days over which the Wildflower Society survey was undertaken.

All species recorded are flowering plants, except one cycad (*Macrozamia fraseri*). Of the plants recorded during the surveys, 26 species are orchids and 43 species are introduced including the Declared Plant Paterson's Curse (*Echium plantagineum*) which is widely distributed along the southern boundary.

Echium plantagineum is listed as a Declared Plant under the *Agriculture and Related Resources Protection Act*. In accordance within the Act, population of Declared Plants are required to be adequately managed to prevent further invasion of the plant in WA.

2.4.8 Significant Flora

A search of the Department of Conservation and Land Management's Declared Rare and Priority Flora Species database was undertaken in July 2002 to identify significant flora known to occur at or in the vicinity of the Park. The search identified seven significant flora species occurring in the KHP area. Two species that have recently been taken off CALMs Declared Rare and Priority Flora Species list, *Daviesia physodes* and *Lysinema elegans*, were recorded from the site.

A total of 96 plants of the Declared Rare Orchid, *Caladenia huegelii*, were recorded from Ken Hurst Park during the September/October survey undertaken by ATA Environmental. Ninety two of these plants were recorded from the section of the Park that occurs to the north of the rail line. The remaining 4 plants were recorded from the southeastern corner of the Park. A recent survey undertaken by MRWA of the proposed Roe Highway alignment (Stage 7) adjacent to the northern boundary of Ken Hurst Park recorded more than 130 plants from within the proposed highway road reserve immediately abutting of KHP (R. Hart, pers. comm., 2002). Several other surveys that have been undertaken within and in the immediate vicinity of the Park in recent years (ie. Weston, 1997 (unpub.) and Brown, ?) have identified approximately 200 additional plants, making the population within KHP the most extensive and significant in the State.

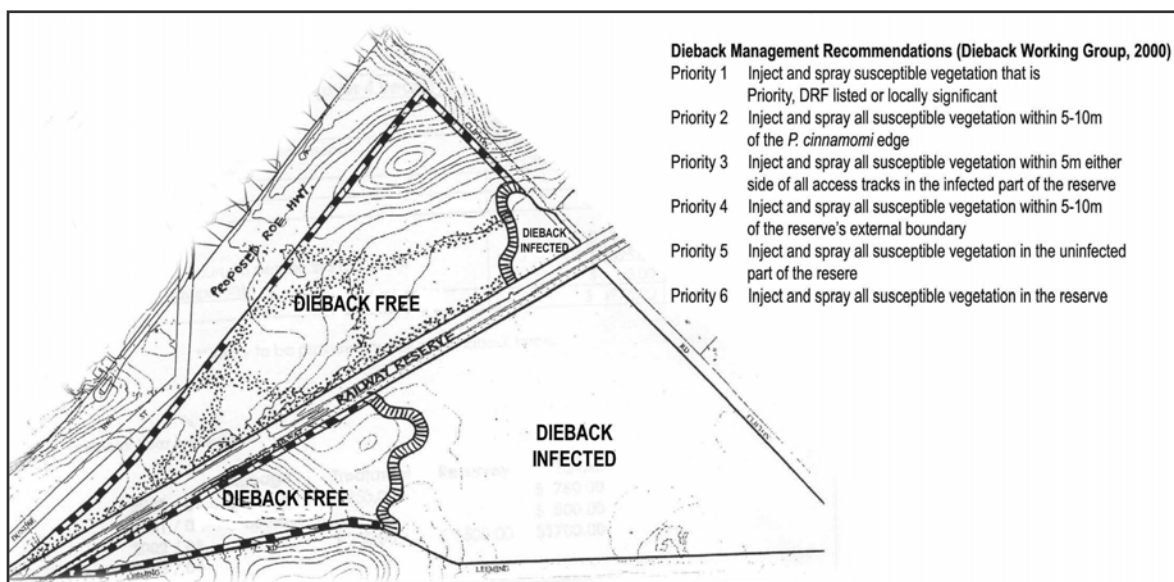
2.4.9 Dieback

KHP was surveyed for the presence of the Dieback disease (*Phytophthora cinnamomi*) by Glevan Dieback Consultancy Services in May 1999 and 2002.

The survey involved recording plant deaths of species that are susceptible (indicator species) to the disease on the basis of observation and laboratory tests (a total of ten soil and plant samples were tested). Sixteen species were found to provide a good indication of the presence of Dieback in the Park including, Woolly Bush (*Adenanthos cygnorum*), all *Banksia* species, Pineapple Bush (*Dasypogon bromeliifolius*), *Hibbertia* sp., *Leucopogon* sp., *Lomandra* sp., *Petrophile linearis*, *Patersonia* sp., *Zamia* Palm (*Macrozamia fraseri*), *Stirlingia latifolia* and Grass Trees (*Xanthorrhoea gracilis*, *X. preissii*).

The study determined approximately 50% of the Park is infected with the disease, particularly in the eastern region as shown on the plan below. Dieback is thought to have been introduced from surrounding land uses by uncontrolled vehicle access, maintenance vehicles and soil movement. Accordingly, the study anticipated that the disease will ultimately result in the loss of susceptible species from the Park and a dramatic change in the vegetation composition. However, the study identified that the spread of the disease will be impeded to some extent by the deep, well drained sands in the Park.

Members of the Friends of KHP (D. Corbyn, *pers comm.*) believe that the disease is not as extensive as that suggested by Glevan and is thought to be confined to small pockets in the south-eastern region of the site. This was supported by evidence observed during the flora and vegetation assessment of the Park conducted by ATA Environmental in September 2002.



2.5 Vertebrate Fauna

2.5.1 Habitat

Based on the vegetation assessment, KHP can be broadly separated into the following main habitats:

- Banksia and Sheoak dominated woodland.
- Mixed Banksia and eucalypt woodland
- Paperbark woodland
- Mixed heath in low lying areas

As mentioned in Section 2.4.4 and shown in Figure 4, the habitats are generally in good to very good condition with some areas in better condition.

KHP includes typical dryland habitats as well as areas of low-lying wetland areas. The site supports several species of Banksia including *Banksia attenuata*, *B. menziesii*, *B. ilicifolia* and *B. littoralis*, which together ensure flowering, and therefore provide a food source for nectivorous species, essentially throughout the year.

A paucity of suitable nesting hollows and large trees has been noted within KHP (Dell and Cooper, 1992). This limits populations of species that rely on hollows such as parrots and owls, and birds of prey and other species that require tall trees for breeding.

The rail line that passes through the centre section of the reserve presently dissects habitat within KHP. The road reserve for the planned extension of Roe Highway currently abuts the north-western boundary of KHP providing a vegetated buffer for KHP from residential and cleared areas.

KHP lies near the north-eastern extremity of a relatively large, contiguous area of bushland, primarily associated with Jandakot Airport, that ensures connectivity of populations and for faunal movement. Review of aerial photographs in 1995 and 2000 suggests some surrounding habitat to the north-east of KHP has been recently removed for the construction of the neighbouring regional resource recovery centre (RRRC site). Bushland within the RRRC site was located on the boundary of contiguous bushland area and therefore did not result in substantial fragmentation of bushland in the local area or interruption of connectivity between bushland areas with KHP.

2.5.2 Native fauna

A systematic detailed vertebrate fauna survey of KHP was carried out in spring and early summer 1992 for the City of Melville (Dell and Cooper, 1992). The survey involved systematic trapping across six established sites in a range of vegetation types and opportunistic sampling. The survey recorded a total of 4 frogs, 17 reptile, 36 birds and 8 mammals (3 native species) within habitats of KHP or nearby. The species recorded during the 1992 survey at each survey site are listed in Appendix 2.

In addition, a pamphlet entitled 'Birds of the City of Melville' recently released based on records of Birds Australia WA suggests a further 25 bird species are known from KHP. These species are included in the overall list of recorded species in Appendix 2. It is not known however, how recently these species were recorded within KHP.

Vertebrate fauna surveys have also been conducted within the adjoining Jandakot Airport bushland. A list of species recorded within the airport area that was provided as part of preparing this management plan indicates several additional species are known from the local area (Appendix 2). This includes 1 amphibian, 10 reptiles, 6 birds and 11 mammals. The list of mammals includes the introduced Black Rat and 8 species of bats, although records of 4 of these are listed as unconfirmed. Further survey of the Jandakot Airport bushland currently being carried out may reveal additional species in the local area that have not been identified previously within KHP or the airport area.

The 1992 survey report commented that species diversity recorded was relatively high for the size of the reserve. The high species diversity for a reserve of this size may be attributable to the range of habitats including wetland and dryland areas, and/or the connectivity with larger areas of native vegetation associated with the Jandakot Airport.

2.5.2 Significant Fauna

The total list of species recorded within KHP includes 22 species that are considered to be of special conservation significance (Appendix 2). This includes species afforded special protection under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and/or *Wildlife Conservation Act 1950*, identified on CALM's Priority Fauna list or identified as Significant Bird Species in Bush Forever. These species are discussed further below.

One species listed as Endangered under provision of the *Environment Protection and Biodiversity Conservation Act 1999*, the Short-billed (or Carnaby's) Black-Cockatoo (*Calyptorhynchus latirostris*) has been recorded within KHP.

A review of databases maintained by CALM in July 2002 indicates the following species listed as Specially Protected under provisions of the *Wildlife Conservation Act 1950*, or as Priority taxa have been recorded in the vicinity of KHP:

Schedule 1 (Fauna which is Rare or likely to become Extinct)

- Numbat *Myrmecobius fasciatus*
- Short-tailed (Carnaby's) Black-Cockatoo *Calyptorhynchus latirostris*

Schedule 4 (Fauna which is Otherwise Specially Protected)

- Peregrine Falcon *Falco peregrinus*

Priority Taxa

- Southern Brown Bandicoot (Quenda) *Isodon obesulus fusciventor* (P4)
- *Leioproctus contrarius*, a native bee (P3)

Of these, the Short-tailed (Carnaby's) Black-Cockatoo, Peregrine Falcon and Southern Brown Bandicoot (Quenda) have been recorded within KHP. In addition, the previous survey recorded the Western Brush Wallaby (*Macropus irma*) [P4] in KHP.

- **Carnaby's Black-Cockatoo** (*Calyptorhynchus latirostris*) This species moves around seasonally in flocks to feeding areas on the coastal plain but breeding occurs mainly in the eastern forests and wheatbelt.

- **Peregrine Falcon** (*Falco peregrinus*) This species is an occasional visitor to areas of open woodland and along margins with cleared land.
- **Southern Brown Bandicoot or Quenda** (*Isodon obesulus fusciventer*) This species still occurs in many areas of the coastal plain where there are areas of remaining woodland or heath with dense undergrowth.
- **Western Brush Wallaby** (*Macropus irma*) This species is found in areas of forest and woodland supporting a dense shrub layer. Although it has disappeared from many small isolated remnants, it may still be present in area given the proximity to nearby bushland and reserves.

Comments based on advice provided by CALM as part of the preparation of this Management Plan in relation to occurrence of other species of significant fauna that have not been recorded in KHP is as follows:

- **Numbat** (*Myrmecobius fasciatus*) This diurnal marsupial feeds almost exclusively on termites and is very vulnerable to predation by foxes and cats. It was recorded at Jandakot Airport in the late 1980's but its persistence in this area is unlikely. Recent fauna trapping and surveys of Jandakot Airport have not recorded this species.
- **Leioproctus contrarius** This species of native bee is apparently dependent on the flowers of the Goodeniaceae and possibly *Lechenaultia stenosepala*. It has been collected at Murdoch. Recent surveys have shown that it is more widespread than previously thought and it could possibly occur in the area in question. *Lechenaultia stenosepala* however, was not recorded within KHP during the 2002 flora survey or 1992 survey.

The available fauna survey data for the area suggests the Western False Pipistrelle (*Falistrellus mackenziei*), which is listed as Priority 4 taxa by CALM, has been recorded within Jandakot Airport, although the record is noted as being unconfirmed.

In addition to the above significant fauna, Bush Forever identifies Significant Bird Species occurring on the Swan Coastal Plain (Government of Western Australia, 2000). Significant Bird Species are identified in four categories, as follows:

- Category 1 - specially protected under the *Wildlife Conservation Act 1950*
- Category 2 - listed on international JAMBA/CAMBA agreements
- Category 3 - habitat specialists with reduced distribution on the Swan Coastal Plain
- Category 4 - wide-ranging species with reduced populations on the Swan Coastal Plain

Category 1 species known to occur on the site are identified above. Two of these species, the Short-billed Black-Cockatoo and Peregrine Falcon, are also considered Category 4. The survey data indicates 9 species listed as Category 3 and 11 species listed as Category 4 have been recorded within KHP (Appendix 2). In addition, the Hooded Robin, a Category 3 species, has been recorded in the adjoining Jandakot Airport bushland.

2.5.3 Pests

Feral species present in the KHP include foxes, rabbits, cats, dogs and mice. Foxes and cats can have a profound impact on local populations of susceptible fauna through predation. Rabbits can significantly alter local habitat through grazing and mounds of droppings by reducing native vegetation cover and encouraging weed growth, and compete with native fauna.

A trapping program for Southern Brown Bandicoot within the adjoining recently constructed waste recycling facility undertaken by ATA Environmental in May 2000 resulted in several young cats being captured and seen, suggesting the population of feral or semi-domesticated cats was quite high in the area. Predation by cats could have a significant impact on native fauna populations particularly of smaller mammals, reptiles and birds.

The fauna survey in 1992 recorded higher density of rabbits in areas where exotic grasses were common. Signs of rabbit activity were less common in areas of better quality, dense, long unburnt bushland.

Numbers of the native Australian Raven were fairly high during the 1992 assessment. Populations of the raven are likely to be enhanced due to the proximity of the landfill site and abundance of food. High populations of the Australian Raven are expected to have detrimental impacts on other native birds as a result of predation on eggs and nestlings.

2.6 Recreational, Educational and Heritage Values

2.6.1 Recreational Value

Recreational pursuits within KHP are currently limited to activities such as nature observation, bush walking and dog exercising. The bushland is also regularly accessed by off road vehicles and motorbikes as evidenced by the number and distribution of tracks that dissect the Park. Pedestrian and vehicle access is readily available from the periphery of the Park from Hollingsworth Way, Dundee Street and Leeming Road (unconstructed).

Rubbish and garden refuse dumping occur along the north-western boundary of the site, industrial rubbish in the southern section and abandoned vehicles are often present within the bushland area.

2.6.2 Existing Facilities & Infrastructure

KHP does not contain any formal recreational facilities or infrastructure. The Park is dissected in the central region by a standard gauge railway.

2.6.3 Educational Value

KHP is not currently utilised for educational purposes by nearby schools and other educational institutions. However the Friends of Ken Hurst Park, an established community group, actively manage the Park in association with the City of Melville by

implementing on-the-ground works and maintaining a resource database. The Friends Group also conducts regular wildflower walks in the Park.

2.6.4 Aboriginal Heritage

A search of the Register of Aboriginal sites, conducted on 20 November 2002, identified a significant area of the City of Melville is encompassed by a registered heritage site. However, according to the register no known archaeological or ethnographic sites of significance to Aboriginal people are located within KHP.

2.7 Community Consultation

A community workshop was held at the Piney Lakes Environment Centre on 17 October 2002 to obtain community input into the development of the Management Plan for the Park.

Community participation at the workshop was invited through the placement of advertisements in the local community newspaper and posters at the City of Melville council offices. Invitations were sent to relevant stakeholders including the Friends of Ken Hurst Park, Main Roads WA, Jandakot Airport, Western Australian Government Railways, Southern Metropolitan Regional Council, City of Canning, City of Cockburn, Leeming Sports Association, Water Corporation and Western Power.

Participants at the workshop supported the development of the Plan to guide the management of the Park over the next five years. There was strong support for the Park to be managed principally for conservation purposes with strategic improvement and installation of facilities such as paths and fencing to control access for passive recreationalists such as bushwalkers.

Participants at the workshop discussed what the principal management objectives for the Park should be and, identified the issues that needed to be addressed to meet the objectives.

The principal management goals for the Park as identified by participants are summarised as follows:

Access

- Controlled egress/ingress is required to restrict access to preferred user groups. This does include periphery fencing to control vehicle and motorbike access.
- Reduced expenditure on fencing may be achievable by utilising existing fencing along the boundaries of Jandakot airport and housing along the north-western boundary. The balance of fencing requirements may be facilitated through negotiations with adjacent landholders including the City of Canning (Waste Disposal Site), the Southern Metropolitan Regional Council (Regional Resource Recovery Centre) and Main Roads Western Australia (MRWA).
- Key access paths to be maintained, others to be closed and rehabilitated.

Car Parking

- Most participants agreed some car parking was required, although minimal, and should be located outside the Park, possibly in the RRRC site.

Revegetation

- Strategic rehabilitation works are required and will require revegetation activities in conjunction with weed control. Informal paths to be closed will require immediate rehabilitation.

Declared Rare Flora

- Total number of the DRF *Caladenia huegelii* recorded in the Park to date is about 500 plants (Eddy Wajon, pers comm, 2002) (includes the future Roe Highway reservation). Management of other issues such as weeds and access will assist in the management of DRF populations.

Dieback

- Impact of disease is evident in the Park, but not to the extent indicated in the Glevan report (1999). It is mainly restricted to the south-eastern region of the Park.
- Further investigation required regarding phosphite aerial spraying of Woodland areas in conjunction with works being undertaken at Jandakot Airport.

Weeds

- Weed mapping and preparation of management plan is required.

Wetlands

- Protection of wetland areas needs to be improved and water table monitoring is recommended.

Vertebrate Fauna / Feral Animals

- Installation of fencing needs to consider maintaining the movement of native fauna and restricting access to feral animals. In addition, cat curfews and baiting for foxes and rabbits need to be considered.

Fire

- Prevention of potential fires through weed management and controlled access. Possibly controlled burns need to be considered in problem areas.

Signage

- Consider installing small number signs at key points on walk trails similar to those in bushland reserve at Lemnos Street, Shenton Park.
- Signage at entry points.

Rubbish

- Rubbish removal is required, including several car bodies. Rubbish dumping/deposition may be reduced by the installation of boundary fencing and controlled access.

Aboriginal Heritage

- Issue was not raised by community members.

Educational Opportunities

- Opportunities were considered limited due to distance to nearest schools/institutions etc.

Roe Highway Interface

- Roe Highway construction is not supported by community but, need to treat bush area of Highway reservation as part of KHP, at this stage. Management measures identified in Plan will apply to the road reserve.

Monitoring

- Management Plan needs to have performance indicators.

The minutes of the community workshop are presented in Appendix 4.

3. MANAGEMENT DIRECTIONS

3.1 KHP Values

Natural Environment Value

KHP contains a variety of ecosystems from upland woodlands, low-lying heath and dampland vegetation that show varying degrees of disturbance generally decreasing with distance into the bushland.

The principal value of KHP at present is that it is a large area of diverse bushland that includes upland and wetland type vegetation and fauna habitat.

Landscape Value

KHP provides significant landscape and amenity opportunities to the region. The vegetation cover of the Park is good, and it provides an area of bushland in an urban and industrial setting.

Recreational Value

The recreational value of KHP, based on current usage and visitation, is not high. There are many opportunities to provide improved facilities in the Park that could dramatically increase the preferred use of the Park by the community. Recreational demand and use of the area is not likely to increase significantly in the future as the surrounding residential development has limited capacity to expand.

Cultural Heritage Value

KHP has limited heritage value as no registered sites of significance to Aboriginal people or non-Aboriginal people are known to occur in the study area.

Research Value

KHP has research value for the maintenance of bushland supporting significant flora populations, particularly the Declared Rare Orchid, *Caladenia huegelii*.

3.2 Management Vision

3.2.1 Vision

Community consultation and discussions with the City of Melville indicate that the principal management vision for the Park is to maintain and enhance the conservation value of the bushland. This is consistent with the objectives of Bush Forever which has identified KHP as supporting regionally significant values.

3.2.2 Goals

Conservation

Protect and conserve KHP's natural values, and enhance these values through the implementation of appropriate management measures such as access controls, revegetation, weed and dieback management.

Recreation

Provide opportunities for recreational use of the Park compatible with the protection of KHP's existing values and ensure sound management to minimise conflict between users and other management objectives.

Information, Interpretation and Education

Facilitate informed appreciation of KHP's natural environment amongst the community through the provision of appropriate facilities (ie formalised access and signage). Promote community ownership of the area and enable access to information and liaison regarding management.

Research and Monitoring

Seek a broader understanding of issues such as Declared Rare Flora protection and management and dieback spread prevention. Monitor impacts associated with use of the area, changes in the natural environment and effectiveness of management techniques.

Management Strategies

S1	Establish conservation as the primary goal of KHP and allow and promote managed recreational, educational and research activities consistent with the conservation objectives.
S2	City of Melville to re-zone Ken Hurst Park to Local Open Space (reserved for Conservation) under the CPS.

4. CONSERVATION MANAGEMENT

4.1 Principal Conservation Direction

Conservation of the natural environmental values of KHP is the principal management objective for the Park.

The key conservation strategy will be to conserve and enhance the natural biological diversity, maintain a balance between recreational use and conservation values, rehabilitate degraded areas and promote community involvement and use of the area through the implementation of this Management Plan.

4.2 Vegetation and Flora

The high conservation value of KHP is recognised as part of Perth's Bush Forever (Government of WA, 2000) with the identification of the Park as comprising regionally significant vegetation. A number of attributes contribute to the identification of the Park as regionally significant, and in terms of vegetation and flora, the Park is considered important because it provides a representative example of intact bushland which supports the largest recorded population of the Declared Rare orchid, *Caladenia huegelii*, in the Perth Metropolitan Area and provides habitat for significant fauna species. Importantly, more than 70% of the bushland is in Very Good to Excellent condition with the balance of the Park in Good condition as a result of weed invasion and disturbance to vegetation from uncontrolled access.

To ensure the conservation of the environmental values of the vegetation and flora of the Park and the associated benefits that the bushland provides (ie. fauna habitat, community education and recreation) a number of management strategies will need to be implemented over the timeframe of this Plan. Protection of the Park's flora and vegetation will be achieved by implementing interrelated measures such as access controls and rehabilitation techniques and monitoring of works which are addressed in succeeding sections. Controlled access should restrict disturbance such as trampling and opportunities for dumping of rubbish and garden waste that contribute to the degradation of the bushland.

Management Recommendations – Flora and Vegetation

- | | |
|----|--|
| C1 | Give priority to protecting bushland in very good to excellent condition and areas supporting populations of Declared Rare Flora. |
| C2 | Progressively rehabilitate disturbed areas initially focussing efforts in areas that have greatest potential to impact on better quality vegetation areas and using local native species only. |
| C3 | Rationalise and formalise selected access paths as discussed in Section 5.2.3 and shown in Figure 5. |

C4	Install periphery or strategic fencing (implementation of fencing option will depend on cost and discussion with surrounding land owners) as discussed in Section 5.2.3 and shown in Figure 5 to prevent further disturbance to the bushland.
C5	Minimise the removal or damage to vegetation caused by access management works (ie fence installation, path formalisation).
C6	Consider the protection of significant flora populations when implementing access management works (City of Melville to consult with Friends Group).
C7	Monitor the location and extent of the <i>Caladenia huegelii</i> population.

4.3 Invasive Weeds

Effective weed control is an important component of conservation management to ensure the bushland values are maintained. Weeds have the potential to smother and compete vigorously with native species for space, water and nutrients, as well as adversely affecting the biological integrity of natural communities by altering vegetation structure (Scheltema and Harris, 1995).

Key invasive species to be eradicated and invasion monitored include Paterson's Curse (*Echium plantagineum*), Geraldton Carnation Weed (*Euphorbia terracina*), Rose Geranium (*Pelargonium capitatum*), Perennial Veldt Grass (*Ehrharta calycina*) and Wild Oat (*Avena fatua*).

KHP is an urban remnant and is exposed to ongoing sources of weed invasion from outside pressures (ie edge effects, rubbish dumping) and internal uses (ie proliferation of tracks, spread of weeds through recreational use).

This Plan identifies the location of key invasive weed infestations within the Park according to recent site visits and discussions with Friends of KHP members (refer to Figure 5). However, it is recommended that weed mapping and a management plan is prepared which documents appropriate weed control measures in conjunction with overall rehabilitation techniques. In the interim, any weed control activities should follow the measures identified in Appendix 5.

Management Recommendations - Weeds

C8	Undertake detailed weed mapping for key invasive species and species with potential to become invasive.
C9	Prepare Weed Management Plan.
C10	Implement control of invasive weeds as per Appendix 5 and replace degraded areas with locally native species.

C11	Maintain low levels of weed invasion in Very Good and Excellent condition bushland.
C12	Notify the public during any weed control works which involve chemical application.
C13	Liase with RRRC, Jandakot Airport, City of Canning and surrounding land owners to encourage and promote the control of invasive weeds on land adjacent to KHP.
C14	City of Melville to train and provide equipment to community volunteers in bush regeneration techniques, particularly weed control through hand weeding and other non-chemical methods.

4.4 Native Fauna

Management of KHP in terms of native fauna should focus on minimising loss and alteration of the habitats and refuge for fauna. In general, protection of native fauna will be achieved through mechanisms to protect the vegetation and habitats within KHP by controlling access and minimising disturbances throughout and within adjoining and surrounding bushland that provide linkage or act as movement corridors.

Local fauna populations within KHP of at least the less mobile species are vulnerable should habitats within the area be significantly impacted. Linkage with surrounding areas of bushland enables fauna to disperse and re-establish following significant declines in populations and is important in maintaining populations and faunal diversity. Connectivity with the larger areas of bushland within Jandakot Airport, in particular, should be maintained.

The rail line that currently passes through KHP and dissects habitat may interrupt faunal movement within the site. It may be possible for some alteration within the rail reserve to improve connectivity for ground dwelling fauna. The installation of several culverts of a minimum of 300mm diameter or width/height beneath the rail line could improve movement for species such as the Southern Brown Bandicoot and reptiles. The culverts would need to include directional fencing to guide animals to the culvert and revegetation around the entry and exit points. Depending on the size of the culvert, habitat features such as rocks, logs and vegetative debris might need to be added. Culverts should be installed above the watertable to remain dry throughout the year.

Habitat features such as logs, rocks, decaying timber and leaf litter are important for many fauna species. Hollows within trees, fallen logs and loose bark can provide habitat and refuge for a range of fauna. Decaying timber and leaf litter often support invertebrates that provide food resources for a range of fauna species. These habitat features should be retained within KHP. There should be no removal of natural material from KHP by the City of Melville or members of the community.

A lack of tall trees and suitable nesting hollows limits the range and populations of breeding of species within KHP. Breeding of species requiring tree hollows within the

KHP could be improved through the installation of nesting boxes. Revegetation works should consider the planting of tall tree species to supplement available habitat within the reserve, provided planting of the tree species is in accordance with the natural vegetation types for the area.

Interpretive signage should be used to inform visitors of the native fauna occurring within the area and encourage protection of habitats by controlled access and appropriate activities.

Management Recommendations - Fauna

- C15 Ensure connectivity with adjoining bushland such as that within Jandakot Airport is maintained.
- C16 Restrict access and minimise disturbance of habitats through fencing and formalising access.
- C17 Consider improving faunal movement across the rail line by means such as installing culverts.
- C18 Ensure habitat features such as fallen logs, decaying timber and other vegetative debris are not removed.
- C19 Fire management measures should be aimed at maintaining important habitat features for fauna within the Park.
- C20 Inform the local community about the fauna of the area and encourage their protection by using signage to advise of access and acceptable/unacceptable activities.
- C21 Undertake regular detailed fauna surveys as a follow on from the 1992 survey to identify significant changes in fauna assemblages.
- C22. Install Fauna nesting sites such as boxes and hollow logs.

4.5 Pests

Foxes and cats predate native fauna and can have a profound impact on native fauna, particularly susceptible smaller mammal species that are largely ground dwelling, to the point of causing local extinctions. The control and eradication of these animals is important to maintain and encourage populations of native fauna and is in line with the objectives for the Reserve.

Foxes occur in the KHP area. Baiting for foxes is probably not feasible given the location of the reserve in proximity of residential areas. Non-target species, such as pet dogs, could be inadvertently killed by dried meat or egg baits used to kill foxes.

It is unlikely that feral proof fencing to keep cats and foxes out of the reserve would be feasible and such fencing may interrupt movement of fauna to and from adjoining

bushland for breeding, migration and recolonisation, and affect management objectives relating to public access. It also should be noted that comments received in relation to other fenced metropolitan bushland reserves suggest the members of the public are known to dump unwanted animals inside fenced areas, and therefore control and eradication is a continuing and ongoing process regardless of the installation of feral proof fencing.

Capture of immature cats using baited cages traps during a recent bandicoot relocation program within the adjoining land suggests there may be some merit in undertaking a specific capture program to reduce the number of cats. Capture programs could be undertaken by community groups however, before a program is implemented it will be necessary to determine how new homes will be found for the animals or how the animals will be humanely destroyed.

Consideration should be given to establishing a wildlife protection zone or cat exclusion zone within close proximity (eg within 2km) of KHP to reduce the domestic cat population surrounding the park. It may not be possible to ban cats in the existing residential areas however, residents could be discouraged from keeping cats. Residents should be notified of being within a 2km wildlife protection zone around KHP and provided informative pamphlets on the impacts of cats on fauna and ways to minimise these, such as keeping cats indoors between dusk and dawn and ensuring two bells are attached to collars. The City of Melville could also consider some form of subsidisation for cat sterilisation.

Restrictions should be placed on dogs within KHP and should include maintaining dogs on leashes at all times.

Based on evidence of rabbit activity within KHP, maintaining the quality of bushland or improving the quality through weed control and revegetation, and minimising incidences of fire in KHP should assist in controlling rabbit populations. It may however be necessary for an eradication or control program to be implemented in conjunction with revegetation programs to minimise grazing and ensure successful plant establishment.

Populations of the Australian Raven should decline following closure of the landfill site located adjacent to KHP which should occur in the near future. It is understood the adjacent RRRC site will then receive domestic organic waste, however this material will be stored and composted within an enclosed facility. This should reduce current level of predation of other native bird species.

Management of KHP should involve raising awareness throughout the local community regarding the impacts of domestic and feral cats on native fauna. The local community should be encouraged not to keep cats, and/or to control pets by ensuring bells are worn and the animals are kept indoors between dusk and dawn. Awareness should also discourage dumping of unwanted litters and encourage sterilisation.

Management Recommendations – Pests

C23 Consider regularly implementing a trapping program to reduce cat populations within KHP.

- | | |
|-----|---|
| C24 | Impose controls on dogs within KHP through City of Melville by-laws. |
| C25 | Consider controls on cats within residential areas surrounding KHP through City of Melville policies and by-laws. |
| C26 | Consider implementing control measures for rabbit populations in conjunction with revegetation works if grazing pressure is high. |
| C27 | Promote community awareness regarding the impacts of pets such as cats and encourage residents not to keep cats or to take measures to reduce impacts on fauna. |

4.6 Disease Management

With the knowledge that *Phytophthora cinnamomi* is present in KHP, a plan for the management of the disease was prepared by the Dieback Working Group (2000). The Group identified that a number of measures are required to prevent further spread of the disease and to minimise the impact of existing infections in the Park:

Access Management

- Rationalise the number of tracks by closing or realigning some paths through uninfected parts of the Park.
- If new tracks are required in the future, the alignment should be planned to avoid movement from infected to uninfected areas of the Park.
- Install fencing to prevent access to vehicles and motorbikes that potentially spread the disease.

Maintenance Works

- No soil, gravel, mulch, plants are to be brought into uninfected parts of the Park. If these materials must be introduced, they must be free of *P. cinnamomi*.
- Maintenance activities (such as fencing, track maintenance, rubbish removal) to occur in dry soil conditions, where possible.

Drainage Management

- No drainage water or runoff is to enter the Park.

Community Awareness

- Install signage at the most frequently used entry points advising of infection and measures the community can implement to prevent further spread (ie use of formal paths, preventing vehicle/motorbike use).

Chemical Control

- Implement a program of phosphite treatment by injection and investigate the potential of controlling the disease by aerial spraying with Jandakot Airport.
- Monitor infestations.

Additional information and guidance is provided in guidelines produced by the Dieback Working Group (2000) for local authorities entitled “Managing Phytophthora Dieback-Guidelines for Local Government”. More detailed guidelines for managing dieback within bushland areas extracted from the Dieback Working Group document are provided in Appendix 6.

Management Recommendations – Dieback

- C28 Construct tracks, clear firebreaks and slash woody weeds in dry soil conditions typically in the summer months.
- C29 Any equipment operated in Dieback affected areas should be cleaned down by either washing down or using compressed air before being moved into non-affected areas.
- C30 Weeds that are manually removed should be immediately placed into a container to reduce the potential for vegetative material or soil to be inadvertently transferred to other areas.
- C31 Revegetation works to use direct seeding rather than planting where possible to reduce the potential of introducing infected material with seedlings and saplings. If plants are used these should be sourced from dieback free nurseries. Use mulch that has been sourced from dieback free areas in dieback free and uninterpretable areas.
- C32 Any fill to be used on site, or brought onto the site should be obtained from pits certified as Dieback-free.
- C33 Erect signage to advise visitors of the issues and encourage them to stay on formal paths.
- C34 All machinery operators, contractors and volunteers should be aware of the issues and advised of locations that are or may be infected, and provided strict procedures for the works to be carried out.

4.7 Wetland Management

Two wetlands are located in the southeastern region of the Park. The wetlands typically do not have above-ground water expressions but are damplands which are characterised by seasonally waterlogged soils. The wetlands have been modified in the past with a considerable portion of their original area cleared where it extends outside the boundary of the Park. In addition, the boundary of the southern wetland has been defined by an informal path which is likely to have contributed to the degradation of this area.

The condition of the wetlands is likely to improve following the closure and rehabilitation of internal and peripheral tracks and installation of fencing at the boundary of the Park.

Management Recommendations – Wetlands

C35 Obtain groundwater monitoring data from DEWCP to monitor changes in groundwater levels and quality.

C36 Rehabilitate internal and perimeter tracks around and through the wetlands.

4.8 Fire

Uncontrolled and frequent fires can significantly impact on the ecology of bushland areas and can encourage the spread of weed species, which can further increase the risk of fire. Wild fires within the Park can also threaten lives and properties particularly those located in close proximity to the area along the northern boundary. Fire management should aim to protect people, nearby property and the natural values of KHP in the case of an unnatural fire.

The proposed formalisation of selected paths within the bushland will provide the dual function of vehicle access in the event of fire (Figure 5). In addition, firebreaks are currently maintained at the periphery of the Park and are particularly important at the northern boundary where the Park adjoins private properties.

It should be noted that the maintenance of existing fire breaks does not require the clearing of additional native vegetation, but will require maintenance of vegetative regrowth along the firebreak and weed management along the edges. In addition, overhanging branches will need to be pruned to allow an overhead clearance of 4m, except at corners where a clearance of 5m should be provided. Material such as limestone should be added to firebreaks to ensure these areas are readily trafficable for fire fighting vehicles and minimise the risk of erosion and weed establishment.

Access to KHP for fire fighting purposes will be provided at strategic locations through lockable farm gates (comprising wire mesh) (Figure 5).

In order to reduce the likelihood of intense summer fires, the fuel loading within KHP should be kept at a reasonable level by implementing weed control. Weeds have the potential to increase the fire risk and often proliferate and spread after fire. Weed control by means such as manually removing by hand and use of herbicides such as glyphosate is important in reducing the risk of fire and the need for other fuel reduction methods.

Large areas of weed infestation such as at the boundary of KHP should be rehabilitated, however, until weeds are controlled and the area is rehabilitated, the material may need to be slashed. Care must be taken to avoid damage to native species and along edges of weed infestation areas to ensure further encroachment of weeds into the bushland does not occur.

A detailed Fire Management and Response Plan should be prepared in accordance with Fire Management Planning for Urban Bushland (FESA, 2000). In the event of a fire, the Fire Management and Response Plan aimed at minimising the area affected by fire

through rapid response should be implemented. The management plan should take due account of the presence of Rare plants and the occurrence of dieback. This will require restricting vehicle movement to designated tracks, limiting the movement of soil between uninfected and infected areas and restricting the creation of additional fire access routes during fire fighting.

Management Recommendations - Fire

- C37 Develop and implement a Fire Management and Response Plan for KHP.
- C38 Implement weed control measures as per Management Recommendations C8-C14 that is integrated with rehabilitation works.
- C39. Install signs with contact details for the local Fire and Emergency Services (FESA).
- C40. Hold discussions with CALM/FESA to ensure rapid response as soon as a fire is noted.

4.9 Litter Management

Sources of rubbish in the Park include wind-blown material from surrounding land uses such as the City of Canning landfill site and material dumped from adjacent residences and people accessing the site. A rubbish collection day was undertaken by the Friends of KHP in August 2002 and May 2003 to remove rubbish and other waste material.

Rubbish and litter adversely impacts on the aesthetics of the Park. In addition, the dumping of garden refuse is a source of weed infestation within KHP.

It is anticipated that the installation and maintenance of a perimeter fence will impede further rubbish dumping and deposition of wind blown litter in the Park to some extent. However, depending on the fencing option implemented, additional measures, such as patrolling the Park, may be required to deter illegal rubbish dumping.

Management Recommendations - Litter

- C41 Install fencing at the main entry points of the Park to prevent further dumping of rubbish and garden refuse.
- C42 Consider the use of shade cloth on the existing 2m high cyclone fencing along the boundary of the City of Canning landfill site to prevent wind deposited litter in the Park.
- C43 Conduct yearly litter collection exercises throughout the Park.
- C44 Monitor rubbish/garden refuse dumping from residential properties at the northern boundary of the Park. Present warnings to first offenders followed by an infringement if there is a subsequent offence.

- C45. Install signs at Dundee Street advising potential rubbish dumpers of locations of nearest rubbish receival locations and penalties for offending.
- C46. Patrol boundary of KHP regularly to warn/educate offenders, where and when practicable.

4.10 Management of Roe Highway Interface

The Roe Highway alignment is located along the northern boundary of the Park within a designated road reservation. This section of the Highway forms part of Stage 7 works and is anticipated that construction will commence in late 2004 (following the completion of Stage 6 which is expected by 2004). However, according to MRWA the final alignment for Stage 7 will be determined once the findings and recommendations of the Metropolitan Freight Network Review are handed down.

On this basis, it is proposed that the area of bushland encompassed by the Highway reservation is treated as part of Ken Hurst Park until the Stage 7 alignment is finalised. At such a time, the treatment of the interface between Roe Highway and KHP will need to be addressed to consider issues such as vegetation clearing and management; Declared Rare Flora management, native fauna management and maintenance of public access to KHP.

In the interim, this Plan proposes to manage the road reserve and KHP as one parcel of bushland with recommendations to implement access control such as fencing and gates and rationalise access paths. These measures are discussed in the following sections and will require approval and assistance from Main Roads WA.

Management Recommendations – Roe Highway

- C47. Manage Roe Highway Reservation as part of KHP bushland until construction of Stage 7 is finalised.
- C48. Ensure the treatment of the Highway and Park interface is addressed by MRWA and considers the management of issues such as, but not limited to, vegetation clearing and management; Declared Rare Flora management, native fauna management and maintenance of public access to KHP.
- C49. Manage all bushland in the road reserve not required for Roe Highway Stage 7 as part of KHP once construction is complete.

5. RECREATION AND ACCESS MANAGEMENT

5.1 Principal Recreation Direction

Recreational pursuits in KHP are considered to be minimal and generally limited to passive recreational activities such as bushwalking, nature observation and dog walking. As a result, the requirement to improve and install facilities is negligible and in accordance with the primary objective of Conservation, management of recreation should be focused towards controlling access through the installation of fencing and rationalisation of paths. Recreational use of KHP should not compromise the conservation objectives of this Plan.

The following section documents the recommended improvements and upgrades required to facilitate the objective of conservation.

5.2 Access Controls

At present, no controls are in place to prevent access to the Park by vehicles and motorbikes, and as a result, significant damage to the bushland has occurred. Indiscriminate access to the Park is proposed to be restricted through the installation of fencing and gated access.

5.2.1 Pedestrian Access

Pedestrian access paths are currently extensive throughout KHP and require rationalisation. The Friends of KHP have identified existing paths that should be formalised with the remainder to be closed and rehabilitated. The FKHP have also assigned names to the three main paths within the Park (Zamia Walk, Preissiana Walk and Todtiana Walk). These names are supported in this Plan and should be recognised in signage.

The paths are to be maintained at their current width, however it is recommended that a stable surface is applied such as compacted limestone to prevent weed invasion and clearly define the path.

Management Recommendations – Pedestrian Access

- | | |
|----|--|
| R1 | Formalise selected paths as shown in Figure 5 and rehabilitate closed paths. |
| R2 | Apply crushed limestone to formalised paths. |

5.2.2 Vehicle and Motorbike Access

The use of off road vehicles and motorbikes is not appropriate within KHP other than for maintenance and fire fighting purposes. The area however, is currently regularly accessed by vehicles and bikes. Measures are necessary in order to control access within KHP and reduce the negative impact current access is having on the bushland.

Formal vehicle access is not provided at any location at the periphery of the Park. However, the absence of fencing allows unrestricted access from a number of points including Karel Avenue, Hope Road, Dundee Street (now closed) and Leeming Road (unconstructed). Restriction of vehicle and bike access to the Park needs to be improved and will require the installation of preventative mechanisms such as fencing, boulders, bollards and/or logs at strategic locations.

Discussions with the Environmental Officer from Jandakot Airport recommended the closure of Leeming Road at the southern boundary of the Park. The road is reserved under the City of Cockburn and is currently a limestone track used principally by stolen cars and off-road vehicle users. Use of the road in this manner is a fire hazard and safety issue to the Airport and KHP. In addition, officers from Jandakot Airport are frequently required to assist bogged cars along this road. It is recommended that the City of Melville and Jandakot Airport, in conjunction with the City of Cockburn, investigate excising the road and designating it as part of the airport for controlled access for fire maintenance.

Management Recommendations – Vehicle and Motorbike Access

- | | |
|----|---|
| R3 | Prevent unrestricted vehicle and motorbike access in the Park wherever possible by installing strategic fencing and gates. |
| R4 | Provide access for maintenance and fire vehicles at lockable farm gates (wire mesh). |
| R5 | Investigate, in conjunction with Jandakot Airport, the potential of excising Leeming Road and designating it as part of the airport for controlled access for fire maintenance. |

5.2.3 Fencing

The installation of fencing is considered a priority to maintain and enhance the conservation values of KHP and control recreational pursuits in the Park. It is considered that there are two feasible options for the Park:

Option 1 – fence entire Park as two separate bushland parcels (either side of the rail line) but connect to existing fencing along some boundaries – ie Jandakot airport, and housing along the north-western boundary. Install gates as identified in Figure 5. In addition, this option will require the investigation of the appropriate location for fauna underpasses along the rail line.

- Length of fencing required for Option 1 is approximately 3,330m
Based on:
Perimeter of northern bushland parcel: (utilising existing fencing along NW boundary) ~1,620m
Perimeter of southern bushland parcel: (assuming use of existing fencing along Jandakot Airport boundary) ~ 1,708m

Option 2 – investigate the use of boundary fencing of adjacent land uses and install strategic fencing and gates to close gaps where required.

- Length of fencing required for Option 2 is approximately 500m

Based on installation of fencing in the following locations:

- City of Canning landfill boundary and connection to Jandakot airport;
- Jandakot airport boundary to railway reserve;
- RRRC site to railway reserve;
- Hollingsworth Way;
- Area between John Connell Reserve and railway reserve,
- City of Canning landfill boundary to railway reserve.

Depending on negotiations with surrounding land owners, Option 2 will be most cost effective and will provide beneficial results in preventing further degradation of the bushland. However, in the event that the strategic fencing methods proposed in Option 2 are not effective, the City of Melville should investigate installing fencing around the two bushland parcels (ie Option 1).

Management Recommendations – Fencing

- | | |
|----|--|
| R6 | Liaise with adjacent land owners to utilise existing fencing and install additional fencing at strategic locations. |
| R7 | In the event that the utilisation of existing fencing is not effective in restricting access, consider the installation of fencing at the perimeter of the two bushland parcels. |

5.2.4 Gates

The provision of gates at strategic locations around the periphery of the Park will be required to provide access for maintenance vehicles and fire-fighting purposes. Farm style gates (lockable wire mesh gates) are recommended for installation at Hollingsworth Way, the eastern and western corners of the southern parcel adjacent to Jandakot Airport and adjacent to the railway in the western corner of the northern bushland parcel. The farm style gates are to be installed at the same time as the fencing.

Access to walk trails within the Park will be provided at strategic locations to enable residents from surrounding areas and the community to gain access. At some locations it will be necessary to provide specific pedestrian access through the fencing. This could be achieved by installing bollards however, “kissing gates” or ‘U’ shaped gates should be used for walk trails in preference to bollards to restrict entry for trailbikes.

The specifications of the pedestrian and vehicle access gates is provided in Appendix 7.

Management Recommendations – Gates

- | | |
|----|---|
| R8 | Install pedestrian gates and lockable vehicle access gates in strategic locations as shown in Figure 5. |
|----|---|

5.3 Car Parking

At present, there is no provision for vehicle parking immediately adjacent to the Park. The principal point of access to the Park is currently from the northern boundary of the Park. Most people park their cars in the cul de sac of Hollingsworth Way and walk from there into the Park, or park at Dundee Street.

Community members have indicated the need for improved parking at the Park with the most favourable point located at the eastern boundary in the RRRC site. However, access to the RRRC is controlled and for safety issues is not recommended. The current use of the Park does not warrant expenditure on car parking facilities as options are currently limited to a parking area along Dundee Road. It is therefore recommended that the community continue parking at Hollingsworth Way or Dundee Street with alternative options considered following the completion of Roe Highway.

Management Recommendation – Parking

R9 Community members accessing Ken Hurst Park to continue parking at Hollingsworth Way and Dundee Street.

5.4 Signage

Signage is an important factor in managing recreation in KHP, and minimising the conflicts between recreation and conservation. In addition, when installed in appropriate locations, interpretive signage can provide important information about the bushland ecology including plants and animals.

Following the formalisation of paths and installation of access controls such as fencing and gates, signage should be placed at entry points and along walk trails, requesting people to stay to the paths, advising them when they enter specific areas such as a dieback area, identify hazards and outline how they should conduct themselves.

Management Recommendations - Signage

R10 Erect signage at strategic locations that informs visitors of access, and provides interpretive material about the values of KHP and possible impacts of inappropriate use of the area.

5.5 Interaction with the Community & Other Organisations

The continued improved development of community involvement (eg. Friends groups, local residents, schools) is desirable to ensure that the local community has a sense of ownership of KHP as this will assist active management of the Park and afford a level of protection against the threat of damage by fire, vandalism, etc. In addition, promoting an understanding of the sensitivity of the bushland and wetland ecosystem amongst local

residents and the community will assist in reducing the inappropriate use of the Park (eg. uncontrolled access, rubbish dumping).

The development of a sense of ownership can be achieved by involving the local community in the implementation of works at the Park. At present, the Friends of KHP are instrumental in the implementation of management measures and the City of Melville should encourage this group to maintain their involvement in the management of KHP.

It is important to ensure that the efforts of the local community towards the future management of KHP are recognised. This can be achieved by installing signage which identifies existing and future management work undertaken by a local community group and provides a point of contact at the City of Melville if community members are interested in becoming involved. Annual or occasional events could also be organised within KHP to thank community members and volunteers and encourage further involvement and input.

Other organisations such as the Weeds Action Network and Wildflower Society may be able to assist with aspects of the management of KHP, particularly in relation to technical aspects, baseline mapping, monitoring and development of detailed site specific plans.

Liaison between community volunteers and organisations and a point of contact at the City of Melville is essential to ensure a coordinated approach.

Management Recommendations – Community Involvement

- R11 Support and encourage involvement of the community and community based organisations in seed collection, tree planting, weed removal and monitoring by informing the community of planned activities and canvassing support.
- R12 Develop programs in association with local schools for involvement with activities such as seed collecting, planting and monitoring, and for visits to KHP to increase awareness and appreciation of the area.
- R13 Seek the input of local residents as part of the process of implementation and review of this Management Plan.
- R14 Use signage or organised events to identify community groups, schools, and other parties that are involved in or sponsor activities associated with management of KHP.

6. RESEARCH & MONITORING

6.1 Principal Research & Monitoring Directions

Research & Monitoring Goal

To further develop and maintain an understanding of the natural environment and requirements for conservation and passive recreational use of the Park.

Research & Monitoring Strategy

Implement a coordinated and effective approach to research and monitoring within KHP.

6.2 Research & Monitoring

Research

KHP offers opportunities for research into rehabilitation, significant flora and bushland management and wetland ecology. Opportunities include transplantation of orchids and orchid propagation and germination.

Monitoring

The priorities for monitoring have been defined by the following key performance indicators:

- vegetation quality (disease, weeds, rubbish);
- dampland health
- recreational use of the Park.

Monitoring should include groundwater quality and levels, vegetation condition and weed and dieback mapping, and visitor use and comments.

The WRC presently coordinates monitoring of groundwater levels and water quality in the vicinity of KHP. Continuation of this program should be encouraged and results reviewed to assess any significant changes in the status of the bushland condition and wetland health. The monitoring should be incorporated as part of the monitoring program developed for KHP.

The local community should be encouraged to participate in monitoring within KHP. All levels of educational institutions can perform monitoring as well as community based groups such as the FKHP, Wildflower Society and Birds Australia. Tertiary institutions could have an instrumental role in investigating management issues such as bushland regeneration and management. It is important however, that a coordinated and consistent approach to the monitoring is adopted.

Implementation of management strategies identified in this Management Plan will be an on-going process that should be flexible in responding to changes in the natural environment, the recreational use of the environment and community values. As such, a

program of monitoring the success of the strategies proposed in this Management Plan will be essential for the purposes of reviewing and updating the plan in 5 years. This will ensure that the aims and objective of the Plan have been achieved and that any new developments in management techniques can be utilised.

Management Recommendations - Monitoring

- | | |
|----|--|
| M1 | Promote research activities within KHP through liaison with relevant agencies and educational institutions. |
| M2 | Support the continuation of current monitoring programs undertaken by the WRC. |
| M3 | Routinely monitor changes in bushland condition and weed distribution, fire events, visitor usage and impacts of activities. |

7. IMPLEMENTATION

7.1 Prioritisation of Management Proposals

All of the management strategies included in this Management Plan are listed in Table 2. Each of the management strategies has been assigned a rating for implementation that identifies those strategies that should be focussed on initially and those that can be implemented at a later time.

The rating system applicable as part of this Management Plan is as follows:

- High [H] Primary importance/implement immediately (within 2 years)
- Medium [M] Secondary importance/implement within 2 – 5 years
- Low [L] Longer term consideration/implement within 5 - 10 years

Responsibility for implementing or overseeing implementation of the management strategy is also identified in the table.

TABLE 2
PRIORITISATION OF MANAGEMENT STRATEGIES

Management Strategy		Rating	Responsible Agency
PRINCIPAL MANAGEMENT DIRECTION			
S1	Establish conservation as the primary goal of KHP and allow and promote managed recreational, educational and research activities consistent with the conservation objectives.	H	CoM
S2	City of Melville to re-zone Ken Hurst Park to Local Open Space (reserved for Conservation) under the CPS	H	CoM
CONSERVATION			
Flora and Vegetation			
C1	Give priority to protecting bushland in very good to excellent condition and areas supporting populations of Declared Rare Flora.	H	CoM
C2	Progressively rehabilitate disturbed areas initially focussing efforts in areas that have greatest potential to impact on better quality vegetation areas and using local native species only	M	CoM; FKHP
C3	Rationalise and formalise selected access paths as discussed in Section 5.2.3 and shown in Figure 5.	M-H	CoM
C4	Install periphery or strategic fencing (implementation of fencing option will depend on cost and discussion with surrounding land owners) as discussed in Section 5.2.3 and shown in Figure 5 to prevent further disturbance to the bushland	H	CoM in consultation with surrounding landowners
C5	Minimise the removal or damage to vegetation caused by access management works (ie fence installation, path formalisation).	H	CoM
C6	Consider the protection of significant flora populations when implementing access management works (City of Melville to consult with Friends Group).	H	CoM
C7	Monitor the location and extent of the <i>Caladenia huegelii</i> population.	M-H	CoM; FKHP
Weeds			
C8	Undertake weed mapping for key invasive species and species with potential to become invasive.	M	CoM in conjunction with FKHP and as part of preparation of Weed MP

Management Strategy		Rating	Responsible Agency
C9	Prepare Weed Management Plan.	M	As per C8
C10	Implement control of invasive weeds as per Appendix 5 and replace degraded areas with locally native species.	M	CoM
C11	Maintain low levels of weed invasion in Very Good and Excellent condition bushland.	H	CoM
C12	Notify the public during any weed control works which involve chemical application.	As required	CoM
C13	Liase with RRRC, Jandakot Airport, City of Canning and surrounding land owners to encourage and promote the control of invasive weeds on land adjacent to KHP.	H	CoM
C14	City of Melville to train and provide equipment to community volunteers in bush regeneration techniques, particularly weed control through hand weeding and other non-chemical methods.	As required	CoM
Native Fauna			
C15	Ensure connectivity with adjoining bushland such as that within Jandakot Airport is maintained.	H	CoM; JA
C16	Restrict access and minimise disturbance of habitats through fencing and formalising access.	H	CoM
C17	Consider improving faunal movement across the rail line by means such as installing culverts.	M-H	CoM
C18	Ensure habitat features such as fallen logs, decaying timber and other vegetative debris are not removed.	H	CoM; FKHP
C19	Fire management measures should be aimed at maintaining important habitat features for fauna within the Park	H	CoM
C20	Inform the local community about the fauna of the area and encourage their protection by using signage to advise of access and acceptable/unacceptable activities.	H	CoM
C21	Undertake regular detailed fauna surveys as a follow on from the 1992 survey to identify significant changes in fauna assemblages.	M	CoM
C22	Install Fauna nesting sites such as boxes and hollow logs.	M-H	CoM
Pests			
C23	Consider regularly implementing a trapping program to reduce cat populations within KHP.	M-H	CoM
C24	Impose controls on dogs within KHP through City of Melville by-laws.	M	CoM
C25	Consider controls on cats within residential areas surrounding KHP through City of Melville policies and by-laws.	M-H	CoM
C26	Consider implementing control measures for rabbit populations in conjunction with revegetation works if grazing pressure is high.	M-H	CoM
C27	Promote community awareness regarding the impacts of pets such as cats and encourage residents not to keep cats or to take measures to reduce impacts on fauna.	H	CoM
Disease Management			
C28	Construct firebreaks and slash woody weeds in dry soil conditions typically in the summer months.	H	CoM
C29	Any equipment operated in Dieback affected areas should be cleaned down by either washing down or using compressed air before being moved into non-affected areas.	H	CoM
C30	Weeds that are manually removed should be immediately placed into a container to reduce the potential for vegetative material or soil to be inadvertently transferred to other areas.	H	CoM
C31	Revegetation works to use direct seeding rather than planting where possible to reduce the potential of introducing infected material with seedlings and saplings. If plants are used these should be sourced from dieback free nurseries. Use mulch that has been sourced from dieback free areas in dieback free and	H	CoM; FKHP

Management Strategy		Rating	Responsible Agency
	uninterpretable areas.		
C32	Any fill to be used on site, or brought onto the site should be obtained from pits certified as Dieback-free.	H	CoM
C33	Erect signage to advise visitors of the issues and encourage them to stay on formal paths.	H	CoM
C34	All machinery operators, contractors and volunteers should be aware of the issues and advised of locations that are or may be infected, and provided strict procedures for the works to be carried out.	H	CoM
Wetland Management			
C35	Obtain groundwater monitoring data from DEWCP to monitor changes in groundwater levels and quality.	L-M	CoM
C36	Rehabilitate internal and perimeter tracks at the wetlands.	M-H	CoM; FKHP
Fire			
C37	Develop and implement a Fire Management and Response Plan for KHP.	M-H	CoM; with advice from JA
C38	Implement weed control measures as per Management Recommendations C8-C14 that is integrated with rehabilitation works.	H	CoM
C39	Install signs with contact details for the local Fire and Emergency Services (FESA).	H	CoM
C40	Hold discussions with CALM/FESA to ensure rapid response as soon as a fire is noted	H	CoM
Litter Management			
C41	Install fencing at the main entry points of the Park to prevent further dumping of rubbish and garden refuse.	H	CoM
C42	Consider the use of shade cloth on the existing 2m high cyclone fencing along the boundary of the City of Canning landfill site to prevent wind deposited litter in the Park.	H	CoM; CoC
C43	Conduct yearly litter collection exercises throughout the Park.	H	CoM; CoC
C44	Monitor rubbish/garden refuse dumping from residential properties at the northern boundary of the Park. Present warnings to first offenders followed by an infringement if there is a subsequent offence.	M	CoM
C45	Install signs at Dundee Street advising potential rubbish dumpers of locations of nearest rubbish receival locations and penalties for offending	M	CoM
C46	Patrol boundary of KHP regularly to warn/educate offenders, where and when practicable	-	CoM
Roe Highway Interface			
C47	Manage Roe Highway Reservation as part of KHP bushland until construction of Stage 7 is finalised.	H	CoM; MRWA
C48	Ensure the treatment of the Highway and Park interface is addressed by MRWA and considers the management of issues such as, but not limited to, vegetation clearing and management; Declared Rare Flora management, native fauna management and maintenance of public access to KHP.	H	CoM; MRWA
C49	Manage all bushland in the road reserve not required for Roe Highway Stage 7 as part of KHP once construction is complete	-	CoM; MRWA
RECREATION AND ACCESS MANAGEMENT			
Pedestrian Access			
R1	Formalise selected paths as shown in Figure 5 and rehabilitate closed paths.	M-H	CoM
R2	Apply crushed limestone to formalised paths.	M-H	CoM
Vehicle and Bike Access			
R3	Prevent unrestricted vehicle and motorcycle access in the Park	H	CoM

Management Strategy		Rating	Responsible Agency
	wherever possible by installing strategic fencing and gates.		
R4	Provide access for maintenance and fire vehicles at lockable farm-style gates.	H	CoM
R5	Investigate, in conjunction with Jandakot Airport, the potential of excising Leeming Road and designating it as part of the airport for controlled access for fire maintenance.	M-H	CoM; JA: CoCo
Fencing			
R6	Liaise with adjacent land owners to utilise existing fencing and install additional fencing at strategic locations.	H	CoM
R7	In the event that the utilisation of existing fencing is not effective in restricting access, consider the installation of fencing at the perimeter of the two bushland parcels.	M-H	CoM
Gates			
R8	Install pedestrian gates and lockable vehicle access gates in strategic locations as shown in Figure 5.	H	CoM
Car Parking			
R9	Community members accessing KHP to continue parking at Hollingsworth Way and Dundee Street.	-	-
Signage			
R10	Erect signage at strategic locations that informs visitors of access, and provides interpretive material about the values of KHP and possible impacts of inappropriate use of the area.	L-M	CoM
Community Involvement			
R11	Support and encourage involvement of the community and community based organisations in seed collection, tree planting, weed removal and monitoring by informing the community of planned activities and canvassing support.	H	CoM
R12	Develop programs in association with local schools for involvement with activities such as seed collecting, planting and monitoring, and for visits to KHP to increase awareness and appreciation of the area.	L	CoM; FKHP
R13	Seek the input of local residents as part of the process of implementation and review of this Management Plan.	M	CoM
R14	Use signage or organised events to identify community groups, schools, and other parties that are involved in or sponsor activities associated with management of KHP.	M	CoM
Monitoring			
M1	Promote research activities within KHP through liaison with relevant agencies and educational institutions.	M	CoM
M2	Support the continuation of current monitoring programs undertaken by the WRC.	M-H	CoM; WRC
M3	Routinely monitor changes in bushland condition and weed distribution, fire events, visitor usage and impacts of activities.	H	CoM

Note: CoM City of Melville
 FKHP Friends of Ken Hurst Park
 CoC City of Canning
 CoCo City of Cockburn
 JA Jandakot Airport
 MRWA Main Roads WA

7.2 Cost of Implementation

Indicative costs for some of the major works proposed in the Park are provided in the following table. Costings are provided for different materials for some of the items to offer cost alternatives (ie type of gates, fencing and signage).

Two options are provided for the total cost as this is likely to vary significantly depending on the fencing option to be installed. Fencing Option 1 is the preferred option in terms of meeting the conservation objectives for the Park, however depending on funding it may be appropriate to install strategic fencing (ie connecting to existing fencing of adjacent land uses) in the first instance and depending on its success, upgrade or extend the area to be fenced.

TABLE 3
Indicative Costs for Implementation of Works

Management Proposal	Estimated Requirements	Cost per unit *	Estimated Total Cost	Option A	Option B	Option C
Walk Paths	Total: ~ 4,500m	Limestone: \$10/ m ²	\$45,000	✓		✓
Fencing – Option 1a (perimeter fencing)	Total: 3,328m (Northern parcel ~1,620m; southern parcel ~1,708m)	Ringlock (1.2m): \$10/m	\$33,280	✓		
Fencing – Option 1b (perimeter fencing)	As above	Steel post and rail and chain link wire (1.2m): \$25/m	\$83,200			✓
Fencing – Option 2a (strategic fencing)	500m	Ringlock (1.2m): \$10/m	\$5,000		✓	
Fencing – Option 2b (strategic fencing)	As above	Steel post and rail and chain link wire (1.2m): \$25/m	\$12,500			
Gates – Pedestrian or Vehicle Access Points	Up to 4 gates	‘U’ Shaped Gate: \$450ea	\$1,800 - \$3,600		✓	✓
		Kissing Gate: \$900ea		✓		
	Vehicle access required at up to 4 locations	Lockable Farm Gate: \$1500ea**	\$6,000	✓	✓	✓
Signage (Sign and posts)	1	Large (80x60cm): \$400ea	\$400	✓		✓
	Up to 5 signs	Small (40x30cm): \$150ea	\$750	✓	✓	✓
Rehabilitation (development of detailed Rehabilitation Plan and implementation of weed control / revegetation)	Rehabilitation works mainly required at bushland perimeter ~ up to 2.5ha (25,000m ²)	\$2.50/m ²	\$62,500	✓	✓	✓
Total Cost				\$151,530	\$76,050	\$199,650

Note: * Estimates identified above do not include costs of on-going maintenance and monitoring

** Cost does not include installation

Costs are GST exclusive

7.3 Term of the Management Plan

The term of this plan will be for a period of 5 years after which time it should be reviewed and updated. A review of the progress of implementation and preparation of a detailed works program should be undertaken after the initial two years. Progress should be assessed by reviewing implementation of each of the management strategies outlined in this management plan and, where appropriate, the amount of money and resources spent in implementing each strategy identified. The need for further review prior to the end of the term should be determined at that stage. It should be acknowledged that maintenance and enhancement of the conservation values of KHP is a long-term project that will involve the City of Melville and the community working together over many years, and extending beyond the life span of this Management Plan.

Amendments to the plan can be made during this term as is necessary or desired to ensure the management strategies reflect those considered most appropriate to achieve the objectives and goals for the area.

The City of Melville will have overall responsibility for coordinating implementation of the recommendations made in this Management Plan and undertaking detailed review of the plan within 5 years.

REFERENCES

- Alan Tingay & Associates (1998) A Strategic Plan for Perth's Greenways. Prepared for Ministry for Planning.
- English, V. and Blythe, J. (1997). Identifying and Conserving Threatened Ecological Communities in the South West Botanical Province. ANCA National Reserves System Cooperative Program.
- Environmental Protection Authority [EPA] (1983) Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority - the Darling System - System Six.
- Environmental Protection Authority (1992) Environmental Protection (Swan Coastal Plain Lakes) Policy, 1992.
- Fire & Emergency Services Authority of WA [FESA] (2000) Fire Management Planning for Urban Bushland, A Guide of Landowners, Fire Officers & Bushland 'Friends' Groups.
- Gibson, N., Keighery, B.J., Keighery, G.J, Burbidge, A.H. and Lyons, M.N. (1994). A Floristic Survey of the Southern Swan Coastal Plain. Unpublished Report for the Australian Heritage Commission prepared by the Department of Conservation and Land Management and the Conservation Council of Western Australia.
- Glevan Dieback Consultancy Services (1999) Ken Hurst Reserve – Assessment for the Presence of *Phytophthora* sp.
- Government of Western Australia (2000). Bush Forever - Keeping the Bush in the City. Perth, WA.
- Hart, Simpson and Associates Pty Ltd (1998) Roe Highway Stage 7 – Dieback. Prepared for ERM Mitchell McCotter.
- Heddl, E.M., Loneragan, O.W. and Havell, J.J (1980). Vegetation of the Darling System. In: Atlas of Natural Resources, Darling System, Western Australia Department of Conservation and Environment, Perth, Western Australia.
- Hill A.L., Semeniuk C.A., Semeniuk V., Del Marco A. (1996). Wetlands of the Swan Coastal Plain, Volume 2b: Wetland Mapping, Classification and Evaluation; Water and Rivers Commission and Department of Environmental Protection.
- Main Roads WA (1998) Flora and Vegetation Survey – Roe Highway Stage 7 (Ranford Road to Kwinana Freeway). Prepared by Anna Napier.
- Quartermaine Consultants (1998a) Report of an Archaeological Survey on Stage 7 Roe Highway Extension From South Street to Kwinana Freeway. Prepared for ERM Mitchell McCotter.

Quartermaine Consultants (1998b) Report of an Ethnographic Survey on Roe Highway Extension From South Street to Kwinana Freeway (Stage 7). Prepared for ERM Mitchell McCotter.

Trudgen, M.E. (1995) *Objection Assessment for Jandakot Airport, Flora Values*. Prepared for the Australian Heritage Commission.

Water & Rivers Commission [WRC] (1997) Perth Groundwater Atlas.

Western Australian Planning Commission (1998) Statement of Planning Policy No. 6 – Jandakot Groundwater Protection Policy.