



GOSS AVENUE RESERVE

NATURAL AREA

MANAGEMENT PLAN 2005

MANAGEMENT REVIEW COMMENT

The 1997 Management Plan for the Goss Avenue Bushland and Curtin Primary School Bushland combined these two distinct, but closely located, Banksia woodland / dampland remnants within the one report to ensure that the Curtin bushland area was not excluded from the City's management considerations.

The current review records what the City has implemented in terms of environmental management of the two areas. It also notes that more intensive environmental management will be necessary to avoid deterioration in the condition of the bushland. This necessity would involve increasing the resource use that is currently being used in the management of the bushland.

The most pressing issue is the control of environmental weeds, notably introduced grasses and bulbs. These control measures need to be undertaken on a broad scale across both bushland areas and by their nature and size, this would involve a large upscaling of expenditure. However, if undertaken these works will reduce in cost over subsequent years and to the point where the City's Natural Areas team can resume total responsibility.

Whilst Goss Avenue Bushland is within the City's direct control, Curtin Primary School requires a different approach in management and this review outlines a structured program of shared involvement between a community facilitator, the school community, an outside funding source and the City. This structure is designed to avoid the City a larger commitment than is reasonable, given the City's limited control over the land, but at the same time progress the good management by funding a plan which has the potential to achieve an outcome not previously possible.

Given the now scarce natural areas remaining within the City of South Perth, it is appropriate for the City to meet its management responsibilities by allocating significantly increased funding to bring management of the two areas in line with current local environment best practice.

The City commends the report to ratepayers and all specific stakeholders. The continued support of all is encouraged and appreciated.

In particular, the long time involvement of members of the City of South Perth Environment Association is appreciated and highly valued. The contribution of Andrew Thomson to the issues of this review and the on-ground volunteer efforts by him and John Feldman is acknowledged.

CONTENTS

CONTENTS.....	3
MAJOR FINDINGS OF THE 1997 MANAGEMENT PLAN.....	5
OBJECTIVES OF THIS REVIEW.....	5
1. INTRODUCTION	
1.1 THE STUDY AREA.....	6
1.2 BACKGROUND.....	6
1.3 PUBLIC CONSULTATION.....	6
1.4 ENVIRONMENTAL STRATEGIES.....	6
1.5 MANAGEMENT OBJECTIVES.....	11
2. CONSERVATION OVERVIEW	
2.1 REMNANT BANKSIA WOODLANDS.....	11
3. PHYSICAL AND BIOLOGICAL ENVIRONMENT	
3.1 CLIMATE.....	12
3.2 GEOMORPHOLOGY AND SOILS.....	12
3.3 FLORA AND FAUNA.....	12
4. CURRENT LAND TENURE, USE, CONDITION AND MANAGEMENT	
4.1 TENURE.....	14
4.2 USE.....	14
4.3 CONDITION AND MANAGEMENT.....	14
5. MANAGEMENT ISSUES	
5.1 ZONING AND NAMING.....	18
5.2 AMENITY AND PUBLIC ACCESS.....	19
5.3 FIRE.....	22
5.4 DIEBACK MANAGEMENT.....	23
5.5 FERAL AND DOMESTIC ANIMALS.....	24
5.6 REHABILITATION.....	25
5.7 COMMUNITY INVOLVEMENT AND EDUCATION.....	29
6. IMPLEMENTATION	
6.1 FACILITATION.....	30
6.2 PRIORITY AND REVIEW.....	31
APPENDICES	
1. FLORA: NATIVE SPECIES(1997).....	32
2. FLORA: INTRODUCED SPECIES(1997).....	37
3. FLORA: NATIVE SPECIES GOSS AVENUE(2004).....	40
4. FLORA: NATIVE SPECIES CURTIN PRIM. SCHOOL(2004).....	41
5. COSTING FOR SPRAYING GRASSES.....	42

6.	PHYTOPHTHORA DIEBACK MANAGEMENT PROCEDURES.....	43
7.	IMPLEMENTATION SCHEDULE.....	44

MAPS

1.	LOCATION.....	7
2.	OVERVIEW OF STUDY AREA.....	8
3 & 4.	AERIAL PHOTOGRAPHS OF EACH SITE.....	9
5 & 6.	VEGETATION CONDITION OF EACH SITE.....	16
7 & 8.	MANAGEMENT PROPOSALS.....	27

MAJOR FINDINGS OF THE 1997 MANAGEMENT PLAN

- Both bushland areas are degraded, particularly Goss Avenue, though restoration is considered possible.
- Manage access by fencing along western boundaries.
- Develop and implement a weed control program, particularly veldt grass.
- Pursue natural regeneration and direct seeding.
- Reduce mowing ingress
- Lay crushed limestone on existing paths and create eastern side path for Goss Ave.
- Rehabilitate the Water Corporation drain.
- Involve community and local school(s) in management activity.

It was recorded that the bushland sites should be managed for passive recreation only, consistent with conservation.

OBJECTIVES OF THIS REVIEW

- Examine the progress towards implementation / success of the 1997 Management Plan recommendations.
- Provide specific and costed recommendations to achieve best practice management of the bushland areas.

1. INTRODUCTION

1.1 THE STUDY AREA

The Goss Avenue / Curtin Primary School bushland sites are located within the City of South Perth, adjacent to Goss Avenue which intersects Manning Road (see Maps 1 & 2). The two areas of bushland are separated by the Curtin Primary School.

The Curtin bushland is located to the north of the Goss Avenue site and is separated by the School's buildings and oval. This site is approximately 1.31 ha in size and is bounded by the rest of the school, Goss Avenue and Henley Street (see Map 3). The Goss Avenue site is approximately 3.82 ha in size and is bounded by Goss Avenue, Curtin Primary School, George Burnett Park and the Manning Library (see Map 4).

1.2 BACKGROUND

The Goss Avenue / Curtin Bushland Management Plan was initiated by the City of South Perth as a result of recognition of its gradual degradation and a desire to improve the environmental management of the site. The Goss Avenue bushland has become severely degraded in places over a number of years as a result of indiscriminate rubbish dumping, unrestricted access, and more importantly, frequent fire. The aim of this plan is to restore and protect the integrity of the bushland by providing a coordinated management response to these issues and others.

The decision to include the Curtin Primary School bushland in the management plan was because of its close proximity to the Goss Avenue site, its increasing infestation with weeds and the ease with which it could be included into the scope of the management plan. Approval to include the Curtin site into the management plan was sought from the Education Department and granted following discussions with the Principal of Curtin Primary School in 1996.

1.3 PUBLIC CONSULTATION

The intention to develop a management plan, accept submissions, and hold a workshop was advertised in the *Southern Gazette* on 9 and 16 April, 1996. Three submissions were received and 12 people attended the workshop at Manning Library on 1 May, 1996. Issues raised in the submissions and at the workshop were addressed in the development of the 1997 management plan.

It should be noted that in the review of this management plan, no additional public consultation was undertaken.

1.4 ENVIRONMENTAL STRATEGIES

The City of South Perth has in place a number of Strategic Objectives to guide present and future policy when considering environmental matters. The City's Environmental Strategic Objective pertaining to the Natural Environment states:

"To sustainably manage, enhance and maintain the City's unique, natural and built environment."

As part of this objective, the City has a strategy to:

"Identify areas and opportunities within the City for revegetation projects and develop and implement appropriate management plans for re-establishing a natural environment."

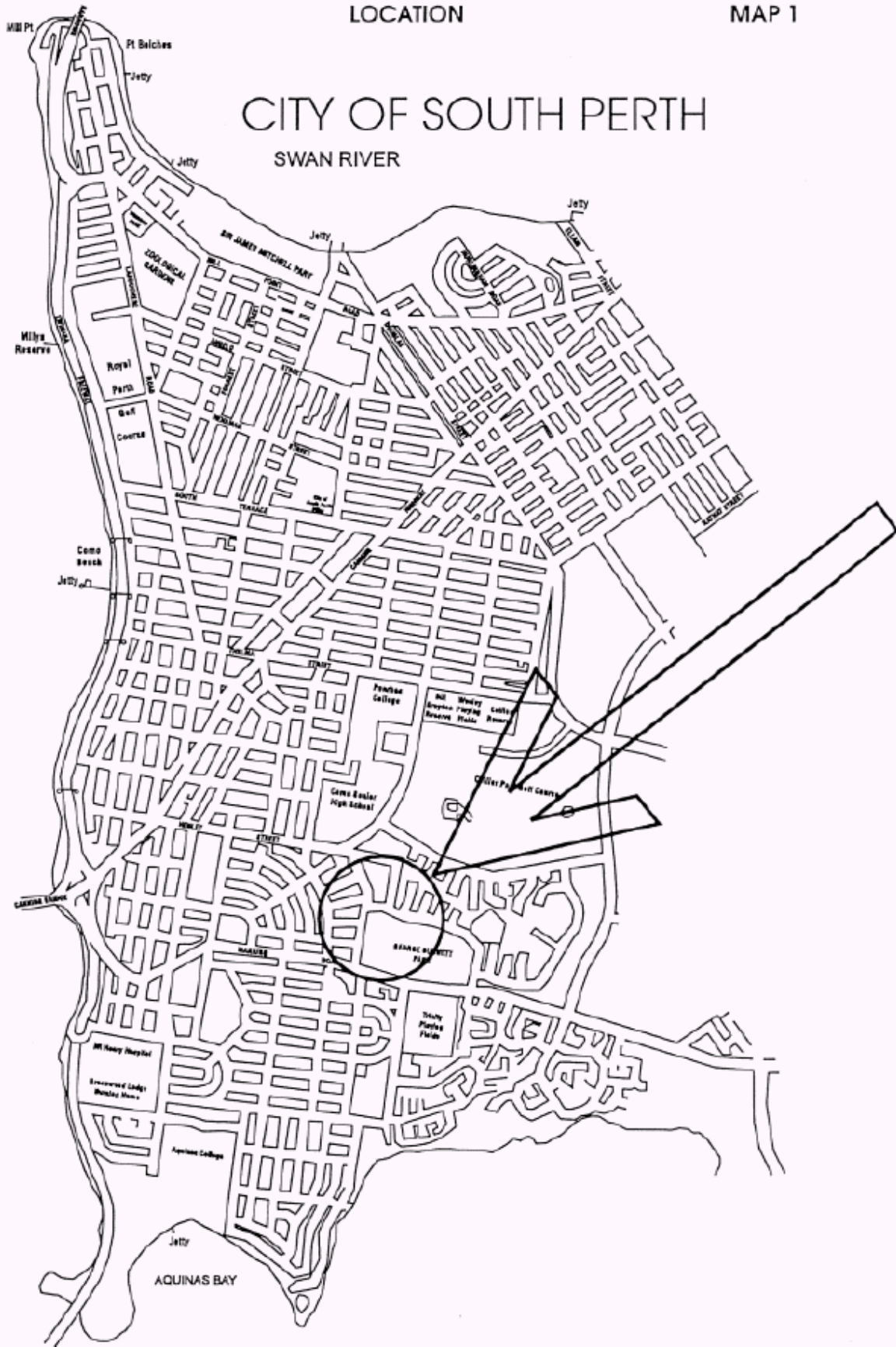
This is the policy background that has led the City of South Perth to develop this and other management plans for remnant bushland and wetland sites.

LOCATION

MAP 1

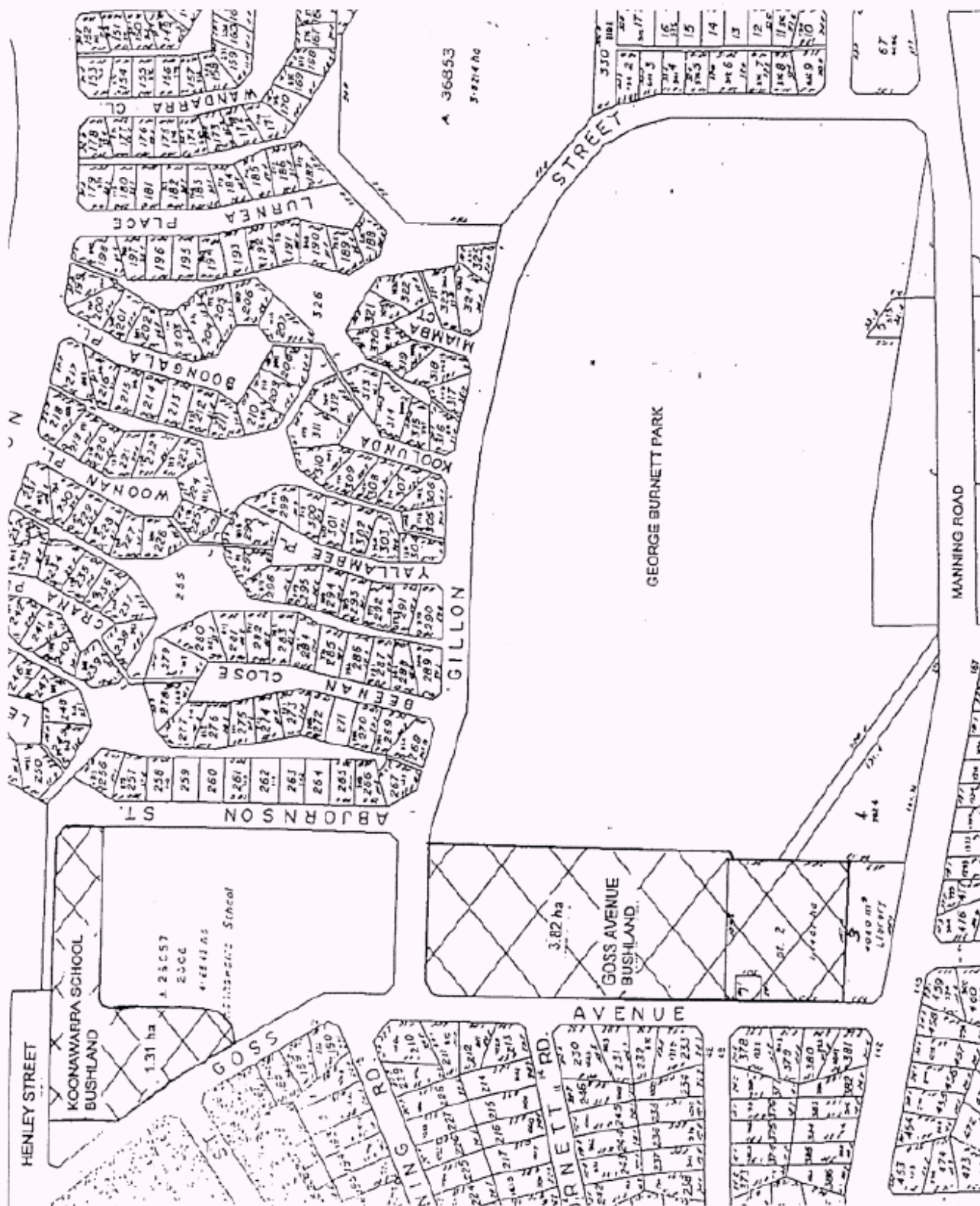
CITY OF SOUTH PERTH

SWAN RIVER

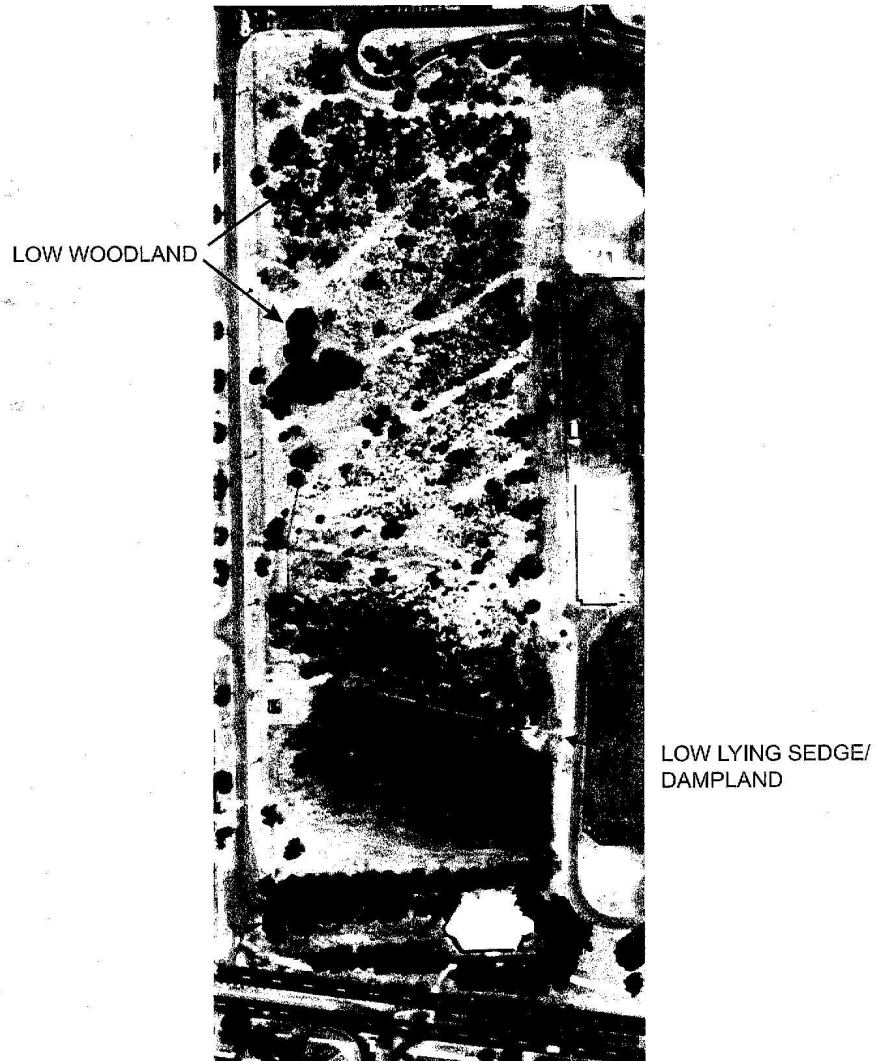


MAP 2

OVERVIEW OF STUDY AREAS



MAP 3 GOSS AVENUE BUSHLAND - JANUARY 1996



MAP 4 CURTIN SCHOOL BUSHLAND - JANUARY 1996



1.5 MANAGEMENT OBJECTIVES

The following management objectives have been developed to provide for the future conservation of the Goss Avenue / Curtin bushland:

- *Identify and document aspects of concern in the bushland which will require future management;*
- *Develop recommendations that will provide the framework to implement strategies for rehabilitating and managing the bushland.*

2. CONSERVATION OVERVIEW

2.1 REMNANT BANKSIA WOODLANDS

Banksia woodland originally covered much of the Swan Coastal Plain, however most of it has been cleared in the face of suburban sprawl. Different types or “complexes” of Banksia woodland can be identified based on differences in vegetation structure. According to Trudgen (1993), the general consensus among botanists is that less than 5% of the original “*Bassendean Complex - Central and South*”, which the Goss Avenue / Curtin sites are representative, remains. Only 1.6% is protected in reserves (Burbidge and Hopper 1989). Trudgen (1993) states, in an ecological survey of the nearby Gillon Street bushland, that:

“...areas of this complex are of significant conservation value, with the degree of this significance related to the size and condition of a particular area as well as other factors such as the particular vegetation types present and the presence of any flora or fauna which is declared rare, or are on the Department of Conservation and Land Management priority lists.”

Subsequently, the conservation importance of any remnant sites of the *Bassendean Complex - Central and South*, is highlighted.

As at February 1997, City of South Perth has within its boundaries several other remnant Banksia woodland sites. These include the Gillon Street bushland, Manning Primary School bushland, Mt Henry Hospital bushland, the remnants surrounding the Aquinas College ovals and the Mt Henry Peninsula bushland.

Only Goss Avenue bushland can be considered relatively safe in the long term. Most of Mt Henry Hospital bushland has been redeveloped, the Gillon Street bushland may be cleared for subdivision redevelopment in the near future and the Education Department has been reviewing the retention of remnant bushland surrounding schools. This could include the Curtin and Manning Primary remnants. In addition, the bushland surrounding Aquinas College, including the peninsula, is privately owned and does not have zoning protection for conservation.

An Urban Bushland Survey conducted for the City of South Perth by students and staff of Murdoch University in 1994 found that bushland remnants represented only 4.4% of the total Local Government area. Remnant banksia woodland comprises only a part of this proportion. In light of this, the importance of the remnant bushland at Goss Avenue to the City of South Perth cannot be under estimated.

3 PHYSICAL AND BIOLOGICAL ENVIRONMENT

3.1 CLIMATE

Perth experiences a Mediterranean climate, which is essentially wet winters and hot dry summers. The mean minimum and maximum temperatures are 18.1 and 30.0 degrees C in summer and 9.0 and 17.4 degrees C in winter. Average annual rainfall for the area is approximately 870 mm, of which most falls in winter.

3.2 GEOMORPHOLOGY AND SOILS

Goss Avenue and Curtin School bushland are situated on the Bassendean soil association of the Swan Coastal Plain. These are ancient aeolian (wind-borne) beach dunes that have been extensively leached, therefore are chemically and physically infertile. The sand is described by Biggs and Wilde (1980) as being created by previous erosional and depositional processes as a result of periods of higher and lower sea levels in earlier periods. Bassendean soils are typically grey humic quartz sands overlying deep yellow sand. This typifies the northern part of the bushland. The southern part of the Goss Avenue bushland, where the Water Corporation drain is situated, is a low lying depression or swampland containing black peaty 'Bassendean Swamps' soils, common throughout the Bassendean soil association.

3.3 FLORA AND FAUNA

Bassendean soils are characterised by Banksia woodland. This is a broad description given to a variety of vegetation complexes found within this range of soils. A botanical survey of the nearby Gillon Street bushland (Trudgen 1993) described that study area as occurring within the *Bassendean Complex - Central and South*. The vegetation found within this Complex, as described by Heddle *et al.* (1980), ranges from woodlands of jarrah-sheoak-banksia on the sand dunes, to a low woodland of *Melaleuca* spp., and sedgelands on the low-lying depressions and swamps.

The bushland remnants at Goss Avenue and Curtin Primary School are part of the same vegetation complex. Goss Avenue however, can be further broken up into two major vegetation divisions:

- Low woodland (in the central eastern and northern sections of the site). The major tree species found in this section include:
Banksia attenuata, *B. ilicifolia*, *B. menziesii*, *Eucalyptus marginata*, *Corymbia calophylla*, *Allocasuarina fraseriana* and *Nuytsia floribunda*.
- Low lying sedge/damp land (in the southern section of the site). The dominant tree species present here is *Melaleuca preissiana*, with some *Nuytsia floribunda* present.

The Wildflower Society, volunteers and members of the City of South Perth Environment Association conducted a detailed botanical survey of the Goss Avenue Bushland and Curtin school bushland sites in October 1996. The resultant species lists detailing native and introduced plants appears in Appendices 1 and 2. One hundred and fourteen native species and 78 introduced species were identified as being present in the two bushland sites from this survey and from a submission on the draft report by Andrew Thomson. In addition, several species of native orchids are known to exist in the bushland sites, but have not been identified. This compares with 113 native and 42 introduced species identified by Hislop (1993) and 90 native and 18 introduced identified by Trudgen (1993) following two separate surveys at the nearby Gillon Street bushland in 1993.

Previous surveys of the bushland sites included one conducted in the Curtin Primary School bushland in 1993 as part of a Curtin University student's Resource Management project (Staude 1993). In addition, a local resident Mr M C Hislop supplied the City of South Perth with a list of trees and shrubs

growing in the bushland surrounding the Curtin school, but excluding the wetter areas closer to the library.

No fauna surveys have been carried out at either site, however Burton's Legless Lizard (*Lialis burtonis*) and a Western banjo frog (*Limnodynastes dorsalis*) have been observed in the Goss Avenue bushland in August 1995 (Thomson 1996 pers. comm.).

A detailed survey was not considered necessary for the bushland sites. An indication of the fauna that may be present in the bushland can be found from a fauna survey conducted at the nearby Gillon Street bushland in 1993 (Bamford and Bamford 1993).

4 CURRENT LAND TENURE, USE, CONDITION AND MANAGEMENT

4.1 TENURE

Three lots make up the Goss Avenue bushland. Combined they give a total area of approximately 3.82 ha. The southern section (Lots 1 and 41 Goss Avenue) comprising some 1.18 ha, is owned freehold by the Water Corporation of Western Australia and is for the purpose of sewerage and drainage. The northern section, part of Lot Part 2 Gillon Street comprises approximately 2.64 ha and is Crown Land vested in the City of South Perth for the purpose of Recreation. The remainder of Lot Part 2, is known as George Burnett Park.

The Curtin Primary School bushland is part of Reserve 28057 comprising 3.56 ha which is vested with the Education Department of Western Australia. The area of bushland within the reserve is approximately 1.31 ha.

4.2 USE

The section of Goss Avenue bushland vested in the City of South Perth was effectively saved from development by a Council Resolution made on 22 December 1976. The area now known as George Burnett Park was then a Council refuse site. Council resolved to delineate the western boundary of the refuse site, therefore retaining the bushland remnant along Goss Avenue Bushland.

The section of Goss Avenue bushland owned by the Water Corporation is used for a sewerage pumping station and a drainage compensation basin for the Manning main drains. The Water Corporation has advised that rehabilitation works can be carried out in their section of the bushland provided they do not adversely impact sewerage or drainage operations. The complete Goss Avenue bushland site is zoned *Park and Recreation Reserve* in the City of South Perth Town Planning Scheme No.5 and in the Western Australian Planning Commission Metropolitan Region Scheme.

The Curtin School site is zoned *Public Use Reserve - Primary School* in the City of South Perth Town Planning Scheme No.5 and in the Metropolitan Region Scheme.

4.3 CONDITION AND MANAGEMENT

The Goss Avenue bushland is at present quite badly degraded in some places, therefore will require careful management to restore. The bushland is also used for passive recreation and as an access way for residents to get to George Burnett Park. This should continue to be encouraged, but carefully managed to reduce the number of access ways to only those considered necessary. An overview of bushland condition at the Goss Avenue site developed by local resident Mr Andrew Thomson is depicted in Map 5.

The bushland has been increasingly managed by the City of South Perth since 1997. Mr Thomson with assistance from Mr John Feldman, have however worked tirelessly in the bushland removing weeds and rubbish, encouraging the bush to regenerate naturally. The City has increased its management from fringe mowing and weed control to encompass numerous activities. Various areas within the bushland have been revegetated with local native species. These plantings have extended to the verge, with this area also being mulched. Large-scale weed control has been undertaken and will continue into the future. Maintenance of the bushland and verges is undertaken by the City's staff.

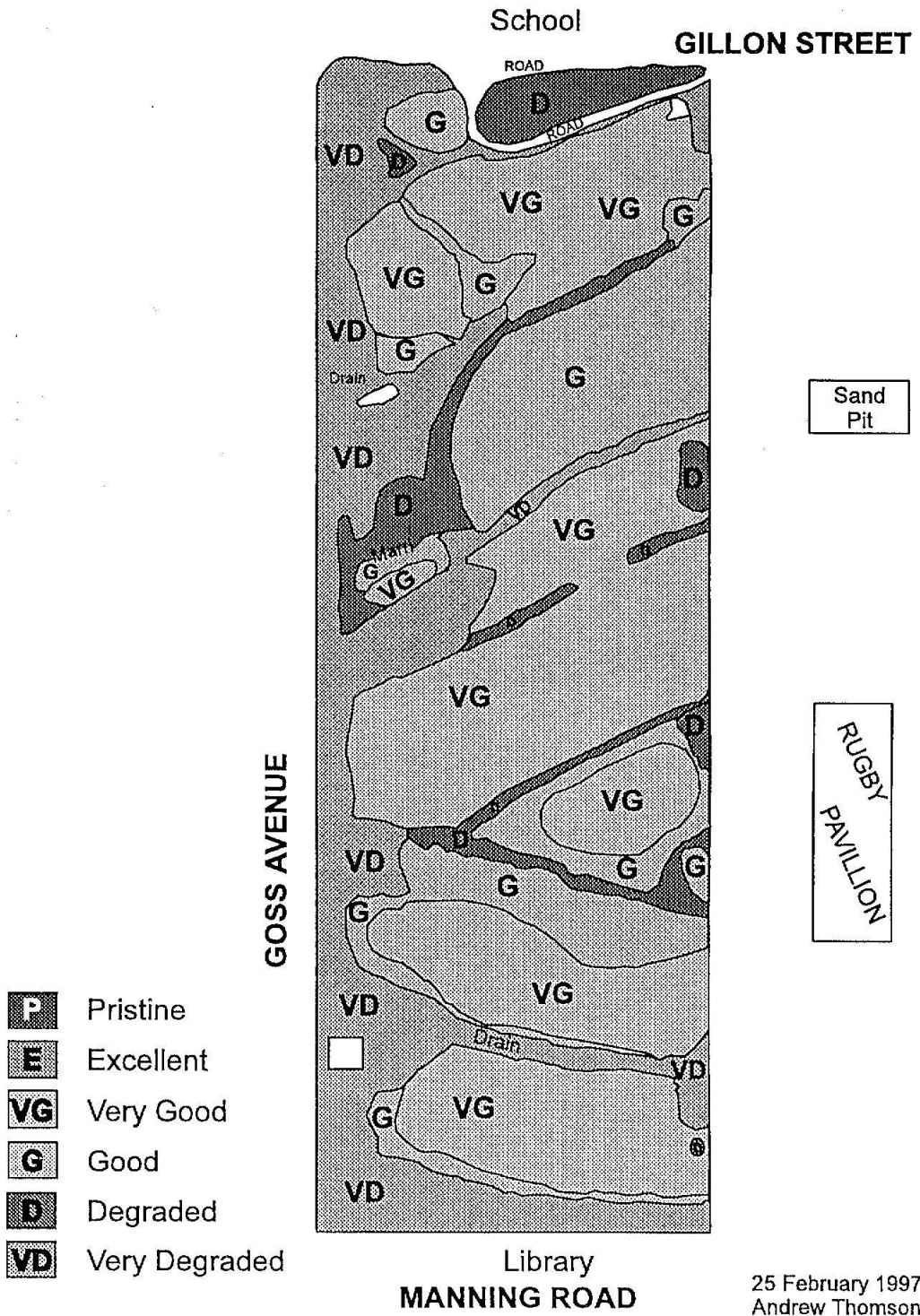
Possible works that could be carried out by the City, either directly by its employees or through provision of funds for contract labour and materials, are outlined in the recommendations made in the following sections. The Curtin Primary School bushland is generally in better condition than that at Goss Avenue. Little management of this section of bushland occurs at all, except for input by Messrs Thomson and Feldman.

The northwestern portion is particularly good with much of the understorey intact and little weed infestation. The rest of the northern strip abutting Henley Street is slowly deteriorating largely due to it being a narrow remnant. The understorey rest of the bushland has considerable weed infestation. Mr Thomson has developed a map of bushland condition for this site as well (see Map 6).

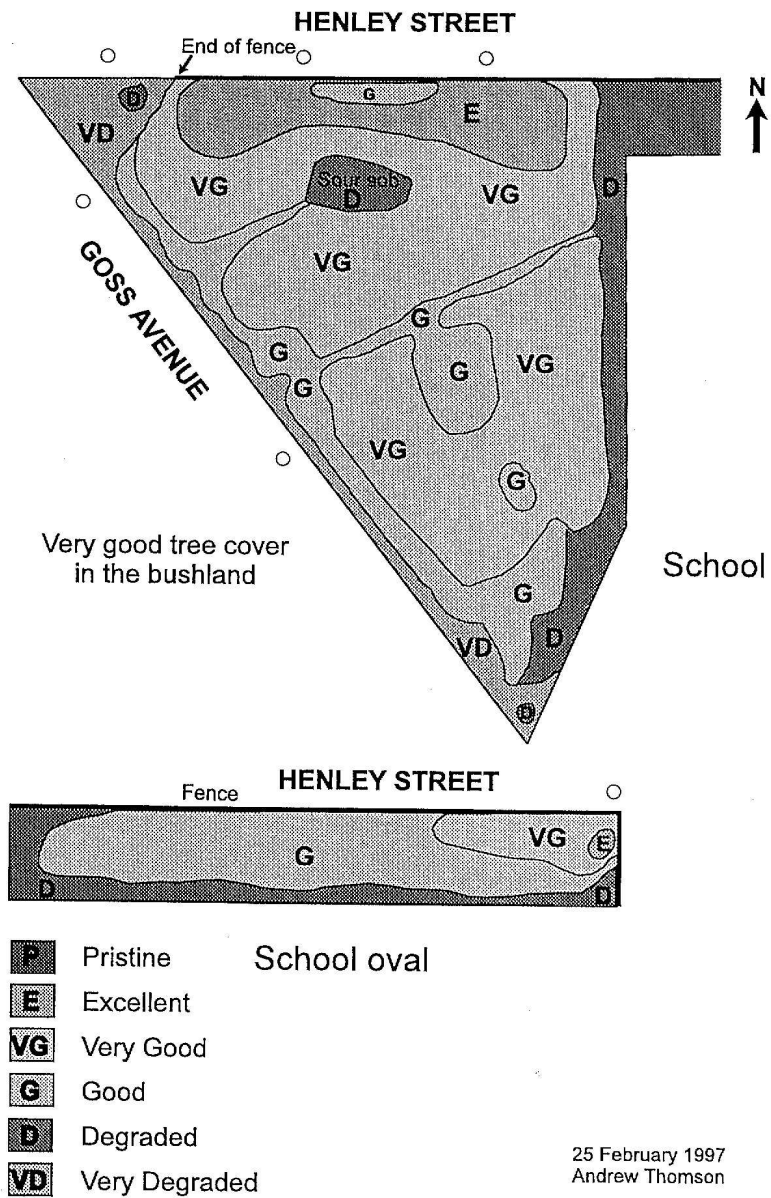
Grass species such as Kikuyu (*Pennisetum clandestinum*), Couch (*Cynodon dactylon*) and Guildford Grass (*Romulea rosea*) have invaded from the adjacent verge and school oval and from clippings which have been indiscriminately dumped in the bushland over the years. Several examples of non-endemic Australian shrubs have also been planted by residents. It appears that this has been done in good faith. This should be encouraged, however the correct species should be provided. This bushland also receives little formal management, apart from a school directive restricting student access into it.

Vehicles have entered the Curtin bushland in the past to remove wood from fallen trees. This has caused some soil compaction and vegetation disturbance which has assisted the encroachment of weeds, especially Guildford grass (*Romulea rosea*). During the development of the 1997 management plan, many tracks meandered through the bushland contributing to the deterioration of bushland condition. A low steel and wire mesh fence delineated the bushland from the Henley Street verge to the north, providing protection and resulting in the relative better condition of the north-western section of the bushland. At the time of this review, fencing had been installed on the western boundary of the bushland, however fencing needs to be completed.

MAP 5 GOSS AVENUE VEGETATION CONDITION



MAP 6 CURTIN BUSHLAND VEGETATION CONDITION



5 MANAGEMENT ISSUES

5.1 ZONING AND NAMING

Objectives:

- **To ensure the zoning of the bushland is consistent with the aims of this management plan;**
- **To foster ownership and promote the importance of the reserves by officially naming them.**

As already indicated, the Goss Avenue bushland site is zoned for park and recreation by both the City of South Perth and the State Planning Commission. At present, no more succinct zoning is available under either scheme, therefore it must be considered that the present zoning is adequate to protect the bushland.

The Curtin Primary bushland is zoned as a school along with the rest of the site and little scope exists for this to be changed. At the workshop held to discuss the future management of the Goss Avenue bushland, it was agreed that the bushland should be used for *Passive Recreation* only and the integrity of the original bush should be restored wherever possible.

At present, the bushland does not have an official name, being commonly known as the Goss Avenue bushland. It was generally agreed at the workshop and in submissions received that the bushland should have an official name which should be placed in a prominent place on the reserve. One process to achieve this could be to invite comment from the community and then for Council to decide.

This Curtin bushland should also be named to afford it more status with the students and community. The process to achieve this will need to be decided by the school or Education Department of Western Australia.

Recommendations:

5.1.1 Council to formalise naming of the Goss Avenue bushland (COSP);

5.1.2 Encourage Curtin Primary School – Education Department of Western Australia to formally name their bushland (EDWA); and

5.1.3 When names have been approved, information signs should be placed in visible parts of each bushland section (EDWA/COSP).

5.2 AMENITY AND PUBLIC ACCESS

Objectives:

- **To provide only for recreation activities considered appropriate with the theme of bushland conservation;**
- **To maintain the visual amenity of the bushland and its surrounds; and**
- **To manage public access, to minimise the level of adverse impact on each reserve.**

The Goss Avenue bushland is presently used for passive recreation activities and as an access way for residents to get to George Burnett Park. The Curtin School bushland was similarly used, even though officially, students were not permitted to access the school through it. This access has now been prevented due to the erection of fencing. It was unanimously agreed at the workshop that both bushland sites should continue to be for passive recreation activities only.

Both bushland sites are surrounded by mulched, local native planted verges. It is important that verges are kept tidy, as they can reflect on the importance of the bushland sites. Parks staff presently maintain the verges.

The utilisation of Goss Avenue bushland as an access way should continue to be supported, but carefully managed to reduce the number of paths to only the main limestone path. This is used to cross the bushland from Goss Avenue to the playground equipment and sporting facilities located in George Burnett Park. These pathways could also be used as the major fire breaks for the reserve (see section 5.3). A pathway is also required on the eastern side of the Goss Avenue site, as a north-south access way from Gillon Street to Manning Road. This will provide a demarcation between the bushland and the grassed areas leading to George Burnett Park and an access way for fire brigade vehicles.

Surplus paths should be closed down immediately and rehabilitated. This can be achieved by the placement of temporary obstructions or inhospitable plants (eg. *Acacia pulchella*) along with rehabilitation works. The designated pathway should then be upgraded by laying and rolling crushed limestone, or similar material, to form a hardened surface. This pathway should also be accessible to the wheelchair bound. A diagram of what is considered to be the best pathway from an access, environmental and fire point of view appears on Map 7. This may need to be ratified by further public consultation.

It was suggested during the workshop that designated access ways within the bushland should be fenced. This is not supported, as it is considered that if the pathways are clearly defined as well as convenient, they will be used by the public.

All major paths through the Curtin bushland should be closed down and rehabilitated (see Map 8). The public should not be prevented from accessing this bushland, however access should be primarily for people interested in the bushland, not for a thoroughfare. Whilst a fence has been installed on the western boundary, fencing the whole bushland has not been completed. Fencing the western boundary reduced access through the bushland, though it is not conclusive as to whether these pathways have been rehabilitated. The closed pathways need to be regularly monitored to ensure that the number of pathways in the bushland does not increase again.

In 1997, the Goss Avenue bushland was delineated from the road verge by a low wooden bollard and rail fence, with a section of high steel post and rail and chain mesh fencing in the vicinity of the drain.

The bollard and rail fence needed repair, and it was suggested that it be replaced with a more suitable post and rail fence. This fence was recommended to be 'ranch style', about 1.2 m high. The higher steel post and rail chain mesh fence should have been removed.

The Curtin bushland had no fencing on its western boundary, or on its internal boundary with the school oval. A steel post and chainmesh fence exists on the northern boundary. Observations of the condition of the bushland immediately adjacent to the northern boundary demonstrates how effective this type of fence has been in reducing the amount of disturbance and subsequent degradation of the bushland. It is therefore considered that a similar fence should be installed on the western boundary as well. Ideally, this should be the same style as that proposed for the western boundary of the Goss Avenue site.

The internal boundary of the bushland should be delineated from the school oval. This could be with bollards. Bollards will enable a clear demarcation to be made between the bushland and the grassed areas and will ensure that encroachment into the former by mowing teams does not continue to occur. The City of South Perth has applied the same principle to the Salter Point foreshore and it is functioning effectively.

Rubbish dumping has been a problem in both areas of bushland in the past. There is a view in the community that urban bushland remnants are considered to be wastelands, therefore places to dump unwanted materials. Items that have been dumped include grass clippings, tree prunings and building rubble. This should be discouraged at Goss Avenue and Curtin School bushland and all existing rubbish cleaned up and taken away.

Wildflower picking is occurring in both bushland sites. This is also illegal and should be indicated by appropriately placed signage.

Recommendations:

- 5.2.1 The bushland sites should be managed for passive recreation only (EDWA/COSP);**
- 5.2.2 Maintain the present program of summer verge mowing (see also recommendation 5.3.4) (COSP);**
- 5.2.3 Liaise with the local community to ascertain which pathways in the Goss Avenue site are the most used and useful. Close down and rehabilitate all formal pathways within the Curtin school site and excess pathways in the Goss Avenue site (see also recommendation 5.3.3) (EDWA/COSP);**
- 5.2.4 Lay and roll crushed limestone (or similar porous material) on remaining pathways in the Goss Avenue site (COSP);**
- 5.2.5 Construct a pathway along the eastern boundary of the Goss Avenue bushland (COSP);**
- 5.2.6 Construct a 1.2 m post and rail fence along the western boundary of the Curtin bushland (EDWA);**
- 5.2.7 Install bollards along the internal boundary of the Curtin school bushland (EDWA);**

- 5.2.8 Following path rationalisation in the Goss Avenue site, install a 1.2 m post and rail fence to replace the existing post and rail fence. Remove the high steel and chain-mesh fence (COSP);**
- 5.2.9 Remove all dumped materials from each bushland site (EDWA/COSP); and**
- 5.2.10 Erect signs to educate residents, reminding them not to dump materials in the bushland or pick wildflowers (EDWA/COSP).**

5.3 FIRE

Objective:

- **To minimise the frequency and severity of fire within the bushland**

It is obvious that the bushland, particularly the Goss Avenue remnant, has been subjected to many fires in the past and these have contributed greatly to its present degraded state. There were at least two major fires in the Goss Avenue bushland in 1995. These were intense fires that occurred on consecutive days in January and effectively burnt out most of the bushland. Another fire occurred at the bushland during the summer of 2004.

It is imperative that the bushland is not subjected to similar intense fires for a number of years as some species require several years to set seed. If a fire, especially one that is intense, re-occurs sooner than the time it takes for a plant species to set seed, then the plant may be lost to the bushland remnant. Fire can also encourage weed growth as it creates gaps in vegetation cover that are readily filled by opportunistic weed species, which often become a major fire hazard themselves. Veldt grass (*Ehrharta calycina* and *longiflora*) and Wild Oats (*Avena fatua*) are prime examples. Subsequently, fire control is a major management consideration for this bushland.

It was suggested at the workshop that some of the existing paths through the bushland could be developed to function as fire breaks as well. Other ways of minimising the impact of fire includes the provision of education programs, raising public awareness of the value of bushland remnants and their susceptibility to fire and reducing the response time of the fire department to a fire outbreak. This can be achieved through the cooperation of local residents and the provision of some basic information on who to contact in an emergency.

The best way to contact the Kensington Fire Brigade is to dial 000. This is because they may already be attending a fire and a direct call to their station will not, in that situation, be answered. A fire management strategy has already been developed for the bushland, in consultation with staff from the Kensington Fire Brigade and input from the local community. This will need to be updated in line with the implementation of this management plan.

Recommendations:

- 5.3.1 Encourage local residents to exercise vigilance over the bushland sites and to report any suspicious activities or fires immediately to the appropriate authorities (COSP);**
- 5.3.2 Maintain a register of fire outbreaks in the bushlands (COSP);**
- 5.3.3 Designate and develop suitable pathways as dual purpose firebreaks in Goss Avenue bushland (COSP);**
- 5.3.4 Ensure that the first verge mowing occurs in spring (September) to reduce fire hazard (see also recommendation 5.2.2) (COSP);**
- 5.3.5 Implement a Veldt grass spraying program within each bush reserve to reduce fuel loads (COSP/EDWA); and**
- 5.3.6 Revise the fire management strategy, developed with the Kensington Fire Brigade, in line with the implementation of this management plan (COSP/KFB).**

5.4 DIEBACK MANAGEMENT

Objective:

- **To manage the current dieback-affected areas to ensure the remainder of the bushland, and other natural areas within the City, are not affected.**

Dieback has been positively identified at Goss Avenue bushland, however the Curtin Primary School bushland has not been investigated. Due to the small size of Goss Avenue bushland, it is likely that all of the bushland is affected by dieback. Further sampling is required to identify the presence of dieback within Curtin bushland. The City should inform the Primary School Principal - Education Department regarding the occurrence of dieback within Goss Avenue bushland allowing them to assess the likelihood of investigating its occurrence within their bushland. Dieback monitoring should occur every six months at Goss Avenue.

A Dieback Management Plan will need to be developed for these bushlands to reduce the spread of the pathogen to other areas. The Plan should incorporate City staff, contractors and residents. Education should form a critical part of the Management Plan.

Hygiene to be implemented at all times whilst undertaking work at this reserve (by all staff, residents and contractors);

- Machinery, vehicles and equipment to arrive at the site free of mud and soil.
 - To clean machinery, use a brush, spade, bar or compressed air in preference to washing down with water.
 - Wash down at designated wash down points (e.g. City's Operations Centre) or on a hard, well drained surface, which does not run off into bushland.
 - Clean machinery, vehicles and equipment before moving to another area.
- Knowing *Phytophthora* dieback occurs within this bushland, do not move from infested to uninfested areas unless the vehicle, machinery and equipment are free of soil and mud.

A comprehensive schedule of management procedures for dieback infested areas can be found in Appendix 6.

Recommendations:

- 5.4.1 Verify the areas of occurrence of *Phytophthora* within Goss Avenue bushland and determine its presence at the Curtin bushland.**
- 5.4.2 Erect signage that warns and informs the public about the occurrence of *Phytophthora* within the bushland.**
- 5.4.3 Develop an information package / brochure to inform residents about *Phytophthora*.**
- 5.4.4 Develop a Dieback Management Plan for the bushlands, this could include the establishment of a *Phytophthora* Dieback Implementation Group. Ensure all relevant staff are aware of the Dieback Management Plan.**

5.5 FERAL AND DOMESTIC ANIMALS

Objective:

- **To investigate the impact of feral and domestic animals on the bushland**

The effect of feral and domestic animals on the bushland at Goss Avenue is uncertain. There is no evidence of the presence of rabbits or foxes in the reserve, however cats from surrounding residences would more than likely be frequent visitors. There is little that can be done about cats and their impact on native fauna, other than public education, unless the City of South Perth resolves to enforce some form of cat control. This would appear to be unlikely. The reserve is not a designated dog exercise area, therefore dogs are required to be on a lead in the bushland. This is consistent with the desire to utilise the reserve for passive recreation and to manage it for conservation as well as allowing dogs and their owners walking opportunities through the bushland.

Recommendations:

- 5.5.1 Support and enforce the existing designation for the Goss Avenue bushland under the Local Law Relating to Dogs. Appropriate signage should be erected (COSP);**
- 5.5.2 Monitor the bushland regularly for the presence of feral species (COSP); and**
- 5.5.3 Support any moves by City of South Perth to educate residents about responsible cat ownership (COSP).**

5.6 REHABILITATION

Objective:

- **To develop and implement strategies to rehabilitate the vegetation within the bushland**

Inspection of the Goss Avenue site and comparison to the vegetation condition map of 1997 indicates that whilst most areas have held their condition and a small number are showing the positive signs of regeneration, the overall position is not positive, given that 7 years have passed. It is obvious that weed invasion, human disturbance and all too frequent fires are having a negative impact on the ability of the bushland to sustain itself and regenerate.

Of concern is the likelihood that two species noted in 1997 could not be located in the flora survey undertaken for this review. *Eriostemon spicatus* and *Nemcia capitata* are not apparent at either site.

All fires present an opportunity to deal with weeds and trials clearly demonstrate that Perennial Veldt Grass can be effectively controlled post fire by surgical application of herbicide. The fire area from summer (2004) should receive this attention now.

It is also now well established that Veldt grass prevents regeneration by not only competition but also by altered soil chemistry. This is particularly the case for *Banksia* sp.

The existence of other environmental weeds, e.g. Geraldton Carnation, Couch and other garden grasses, Freesia, Caltrop and Gladiolas require specific attention but the current major weed issue is Veldt grass.

Disturbance to the dampland / drain area is a significant problem. An extension of the fenced area needs to be considered in conjunction with the Water Corporation to address this issue.

The Curtin bushland is holding condition well since last viewed for the 1997 Management Plan. This is due to its superior original understorey as well as the density of its canopy. However, the bushland is under pressure from invading grasses, rubbish dumping over the west fence and waste disturbance on the border with the school sporting field.

There are also a large number of non endemic trees which have germinated from hosts within the school grounds. A weed control program will be required from 2005 to avoid further deterioration on the site. Disturbance originating from the school side is actually less than would normally be expected, which is possibly a reflection on the very low student numbers and positive support from the school community.

There is no doubt that the fencing installed since the Management Plan has been beneficial, and completion of fencing the site should be a long term consideration for this bushland.

The area containing the Water Corporation drain is also a significant part of these bushland sites. Other than superficial plantings on the extreme edges of the drain, it is difficult to detect whether any significant rehabilitation works have been undertaken. The control of grasses and planting of appropriate species will assist in enhancing the area, and when used in conjunction with extended fencing, the area could improve very rapidly. Some parts could be planted over an extended season given the moisture available. Temporary fencing is likely to be erected during the rehabilitation of this area, following vandalism of efforts in the past three planting seasons.

Quotes should be obtained for the extension of fencing of the drain area and the eastern side of Goss Avenue bushland. A separate quote would be necessary for the Water Corporation drain perimeter.

The Curtin bushland would benefit from a careful application of Glyphosate to the internal fence lines and the edge of the bushland. This task would need to be carried out by experienced bush regenerators to avoid damage to endemic species.

The City should consider Veldt grass control spraying of the entire Goss Avenue Banksia woodland area (not including the drain area at this time). This grass control is time critical and needs to be completed before the end of July (costs over the area are outlined in Appendix 5).

The use of Geophytic spraying of 'Metsulphuron Methyl' on juvenile *Euphorbia terracina* (Geraldton Carnation Weed), is also recommended for July.

The control of broad leaf weeds and bulbs should be reviewed late in July or early August. This cost to the City should not be too large, (approximately \$1600) for the entire Goss Avenue site. Weed control priorities of the Water Corporation drain should also be considered and reviewed at this time.

Further weed control for Curtin bushland and the Water Corporation drain could potentially be the subject of individual project and funding proposals in due course. The 'fire' area should receive prompt attention to control the emerging grasses. This area could also benefit from the direct seeding of Banksia cones.

Seed collection needs to be undertaken from appropriate local reserves for both propagation and direct seeding purposes.

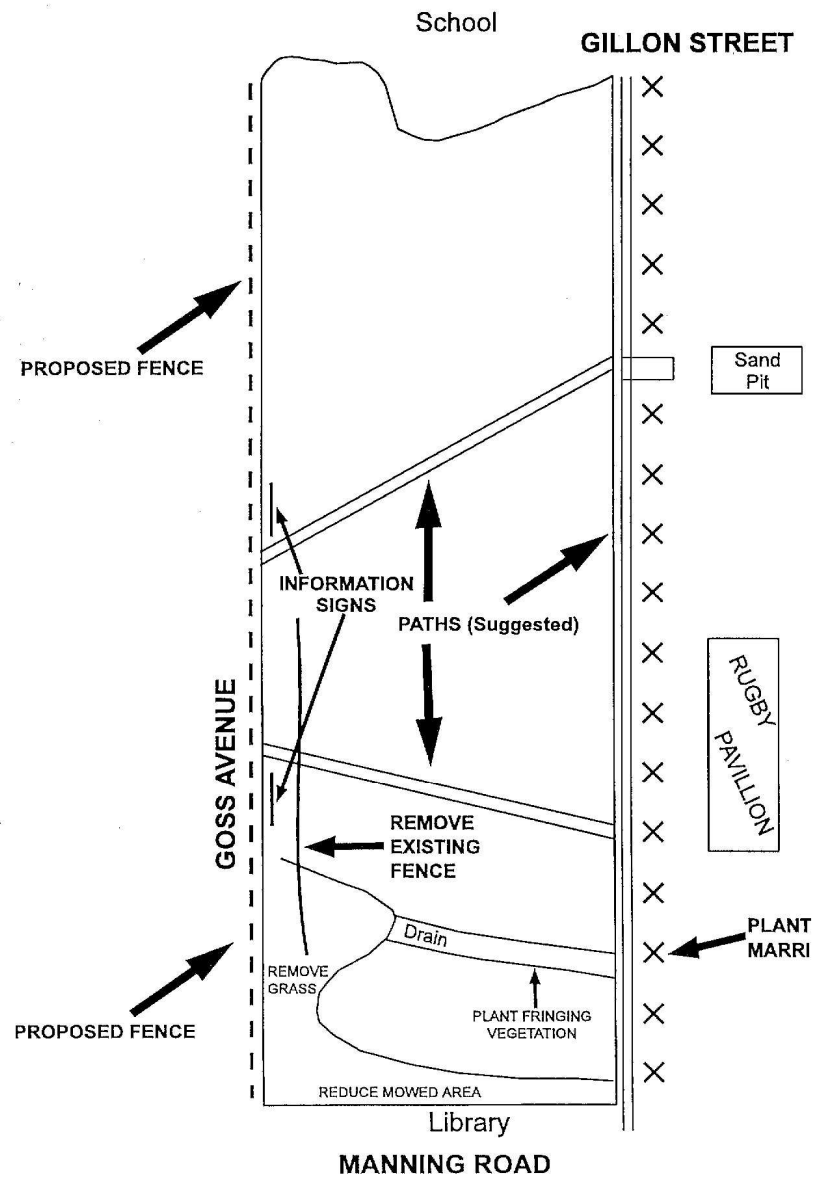
At this time, it is too late to consider a significant direct seeding program for the current season at Goss Avenue, however the collection and distribution of Banksia cones in open sandy areas of the site is recommended.

A propagation and planting program for 2005 should be prepared with a minimum of 1,000 plants and watering should be costed into the plan.

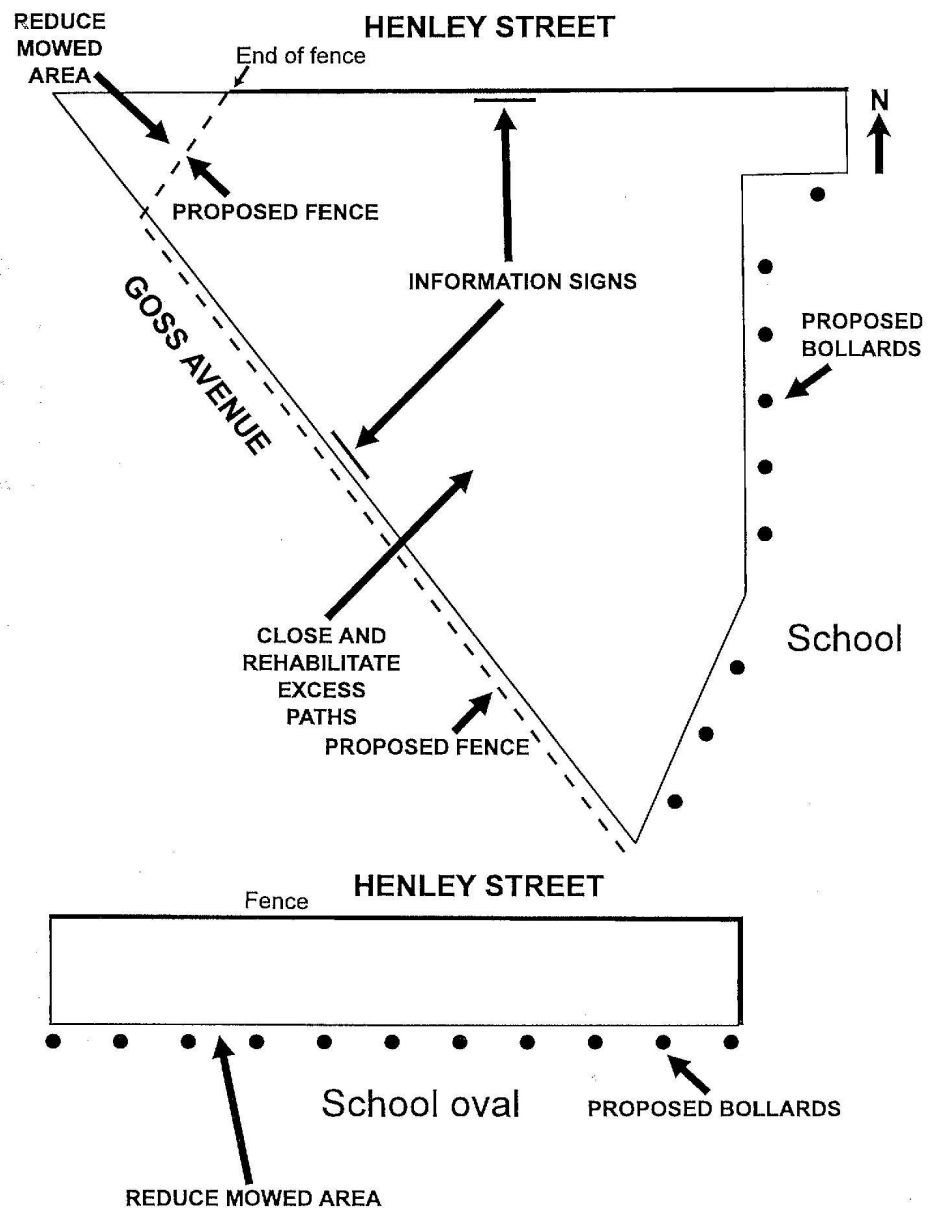
Recommendations:

- 5.6.1 Implement weed control at these bushlands, as outlined in the above paragraphs (COSP);**
- 5.6.2 Revegetate the bushlands. All plantings/direct seeding should be species representative of the vegetation complex, from seed collected either within the reserve or from nearby bushland (EDWA/COSP);**
- 5.6.3 Continue fencing at Goss Avenue to the eastern side of the bushland and fence the Water Corporation drain area (COSP);**
- 5.6.4 Liaise with the Water Corporation to ensure that proposed drain plantings and any proposed works are consistent with their objectives (COSP).**

MAP 7 GOSS AVENUE BUSHLAND MANAGEMENT PROPOSALS



MAP 8 CURTIN BUSHLAND MANAGEMENT PROPOSALS



5.7 COMMUNITY INVOLVEMENT AND EDUCATION

Objectives:

- **To encourage the local community to become actively involved with the management and rehabilitation of the bushland;**
- **To encourage schools to adopt the bushland for curriculum environmental studies.**

Both of these areas could benefit significantly from the creation of an active and well supported 'Friends' group.

The school bushland particularly, requires some dedicated attention by way of meeting and liaising with the school/Education Department, preparation of funding applications (for fencing and weed control), as well as facilitation of activities. It is envisaged that once a critical mass of people and activities are marshaled, then the group can be self sustaining and thereafter work in conjunction with the City in shared management responsibilities.

A communication program running parallel with this group could be an advantage. This would involve residents local to both bushland areas, communicating with regards to community activity, environmental education, fire behaviour / reporting, rubbish dumping and other associated activities.

Similarly, attention to the Water Corporation drain area will also require considerable liaison and some project management and reporting.

Recommendations:

- 5.7.1 Encourage local residents to form a 'Friends' group to care for the bushlands (COSP);**
- 5.7.2 Invite a local school or schools to adopt the Goss Avenue bushland and become involved with its management and rehabilitation (COSP);**
- 5.7.3 Encourage Curtin Primary School to actively involve themselves in the care and maintenance of the school bushland (COSP);**
- 5.7.4 Liaise with the Water Corporation in terms of management of their drain area (COSP).**

6 IMPLEMENTATION

6.1 FACILITATION

Objectives:

- **To identify ways to facilitate implementation of this management plan**

The major source of funding for the implementation of recommendations relevant to the Goss Avenue bushland from this management plan should come from allocations made in the Council budgetary process.

Funding for recommendations relevant to the Curtin School bushland should be the responsibility of the Education Department of Western Australia.

Another source of potential funding for this type of work should come from community based grants. Grants are possible from several sources and are commonly made available to community based organisations which can be supported by Council or who are incorporated. It appears that incorporation is the best method to achieve success when applying for grant monies.

Recommendations:

- 6.1.1 Encourage and advise community based organisations to become incorporated and how to successfully apply for grant monies (COSP);**
- 6.1.2 Ensure adequate funding is provided by Council to conduct a staged implementation of this management plan (COSP); and**
- 6.1.3 Seek support from the Education Department of Western Australia for funds to implement the recommendations relevant to the Curtin bushland (COSP).**

6.2 PRIORITY AND REVIEW

Objectives:

- **To develop a schedule for implementation of recommendations;**
- **To assign a review date to this management plan.**

A priority list or Implementation Schedule of recommendations, as appeared in the 1997 Management Plan, is attached in Appendix 7. The list also displays an approximate costing for each recommendation. Recommendations requiring funding from organisations other than the City of South Perth are indicated in the schedule. It is recommended that major works are incorporated into Council's Forward Works budget so they can be progressively implemented. The minor works are prioritised so they can be budgeted and implemented under Annual Maintenance budgets. Costings and methods for weed control of grasses has been included in Appendix 5, various other weed control methods and revegetation works have been included in Section 5.6.

Most of the recommendations have been assigned a High or Medium priority, depending on its urgency of implementation. Each priority has a time frame of implementation:

HIGH (H) within 2 years,
MEDIUM (M) within 4 years,

In addition, some of the recommendations, such as those proposing routine maintenance, will be ongoing for the life of the management plan, hence the following priority:

ONGOING (O)

This plan should be reviewed again by Council no later than 2008.

Recommendations:

6.2.1 Implement recommendations as per assigned priority (COSP);

6.2.2 Review this management plan on or before the year 2008 (COSP).

APPENDIX 1

FLORA: NATIVE SPECIES	
BOTANICAL NAME	COMMON NAME
CYCADS	
ZAMIACEAE	
<i>Macrozamia riedlii</i>	Zamia
FLOWERING PLANTS	
ASTERACEAE	
<i>Podolepis gracilis</i>	Slender podolepis
<i>Senecio lautus ssp. maritimus</i>	Coastal groundsel
<i>Siloxeros humifusus</i>	Procumbent siloxerus
ANTHERICACEAE	
<i>Amocrinium preisii</i>	
<i>Caesia micrantha</i>	Pale grass lily
<i>Corynotheca micrantha</i>	Netbush
<i>Johnsonia pubescens</i>	Pipe lily
<i>Laxmannia squarrosa</i>	
<i>Thysanotus manglesianus</i>	Climbing fringed lily
<i>Thysanotus multiflorus</i>	Fringe lily
<i>Tricoryne elatior</i>	Yellow autumn lily
APIACEAE	
<i>Centella cordifolia</i>	
<i>Homalosciadium homalospermum</i>	
CASUARINACEAE	
<i>Allocasuarina humulis</i>	Dwarf sheok
<i>Allocasuarina fraseriana</i>	Common sheok (Condil)
CENTROLEPIDACEAE	
<i>Centrolepis aristata</i>	
COLCHICACEAE	
<i>Burchardia congesta</i>	Milkmaid
CRASSULACEAE	
<i>Crassula colorata var. acuminata</i>	Dense stonecrop
<i>Crassula colorata var. colorata</i>	Dense stonecrop
<i>Crassula colorata var. decumbens</i>	Dense stonecrop

APPENDIX 1 (Cont.)

CYPERACEAE	
<i>Baumea juncea</i>	Bare twigrush
<i>Isolepis cernua</i>	Nodding club-rush
<i>Isolepis marginata</i>	
<i>Isolepis stellata</i>	
<i>Lepidosperma longitudinale</i>	Common sword sedge
<i>Lepidosperma squamatum</i>	
<i>Lepidosperma</i> sp.	
<i>Mesomelaena pseudostygia</i>	
<i>Schoenus subfascicularis</i>	
<i>Schoenus pedicellatus</i>	
DASYPOGONACEAE	
<i>Calectasia cyanea</i>	Blue tinsel lily
<i>Dasypogon bromeliifolius</i>	Pineapple bush
<i>Lomandra caespitosa</i>	Tufted mat rush
<i>Lomandra suavis</i>	
<i>Lomandra</i> sp.	
DILLENIACEAE	
<i>Hibbertia huegelii</i>	
<i>Hibbertia hypericoides</i>	Yellow buttercup
<i>Hibbertia racemosa</i>	Stalked guinea flower
DROSERACEAE	
<i>Drosera erythrorhiza</i>	Red ink sundew
<i>Drosera glanduligera</i>	
EPACRIDACEAE	
<i>Conostephium pendulum</i>	Pearl flower
<i>Leucopogon conostephiodes</i>	
GOODENIACEAE	
<i>Dampiera linearis</i>	Common dampiera
<i>Goodenia pulchella</i>	
<i>Leschenaultia floribunda</i>	
<i>Scaevola repens</i> var. <i>repens</i>	
HAEMODORACEAE	
<i>Anigozanthus humilis</i>	Catspaw
<i>Conostylis aculeata</i>	Prickly smokebush
<i>Conostylis juncea</i>	
<i>Conostylis setigera</i> ssp. <i>setigera</i>	Bristly conostylis
<i>Haemodorum spicatum</i>	
<i>Phlebocarya ciliata</i>	

APPENDIX 1(Cont)

HALORAGACEAE	
<i>Gonocarpus pithyoides</i>	
JUNCACEAE	
<i>Juncus pallidus</i>	Pale giant rush
LAMIACEAE	
<i>Hemiandra pungens</i>	Snakebush
LAURACEAE	
<i>Cassytha sp.</i>	Dodder laurel
LOBLIACEAE	
<i>Lobelia alata</i>	
LORANTHACEAE	
<i>Nyctia floribunda</i>	Christmas tree
MIMOSACEAE	
<i>Acacia pulchella</i>	Prickly Moses
<i>Acacia saligna</i>	Golden-wreath wattle
<i>Acacia stenoptera</i>	Narrow winged wattle
<i>Acacia willdenowiana</i>	Grass wattle
MOLLUGINACEAE	
<i>Macarthuria australis</i>	
MYRTACEAE	
<i>Astartea aff. fascicularis</i>	
<i>Calytrix flavescens</i>	
<i>Corymbia calophylla</i>	Marri
<i>Ereamea pauciflora</i>	Orange eremaea
<i>Eucalyptus marginata</i>	Jarrah
<i>Eucalyptus rudis</i>	Flooded gum
<i>Eucalyptus todtiana</i>	Prickly bark
<i>Hypocalymma augustifolia</i>	White myrtle
<i>Hypocalymma robustum</i>	Swan River myrtle
<i>Melaleuca preissiana</i>	Stout paperbark (Modong)
<i>Melaleuca raphiophylla</i>	Freshwater paperbark
<i>Melaleuca seriata</i>	
<i>Melaleuca thymoides</i>	
<i>Pericalymma elliptica</i>	
<i>Regelia ciliata</i>	
<i>Scholtzia involucrata</i>	

APPENDIX 1 (Cont)

ONAGRACEAE	
<i>Epilobium billiarderianum</i> ssp. <i>intermedium</i>	
ORCHIDACEAE	
<i>Microtis</i> sp.	Mignonette orchid
<i>Microtis media</i>	
<i>Pterostylis vittata</i>	Banded greenhood
PAPILIONACEAE	
<i>Bossiaea eriocarpa</i>	Common brown pea
<i>Daviesia physodes</i>	
<i>Daviesia triflora</i>	
<i>Eutaxia virgata</i>	
<i>Gompholobium tomentosum</i>	Hairy yellow pea
<i>Hovea trisperma</i>	Common hovea
<i>Jacksonia furcellata</i>	Grey stinkwood
<i>Kennedia prostrata</i>	Running postman
<i>Nemeia capitata</i>	Bacon and eggs
PHORMICACEAE	
<i>Dianella revoluta</i>	
POACEAE	
<i>Agrostis avenacea</i>	Blown grass
<i>Amphipogon turbinatus</i>	
<i>Austrostipa</i> sp.	
PROTEACEAE	
<i>Adenanthos cygnorum</i>	Woolly bush
<i>Banksia attenuata</i>	Candle banksia (Biara)
<i>Banksia ilicifolia</i>	Holly leaf banksia
<i>Banksia menziesii</i>	Firewood banksia
<i>Persoonia saccata</i>	Snotty gobble
<i>Petrophile linearis</i>	Pixie mops
<i>Stirlingia latifolia</i>	Blue boy
RESTIONACEAE	
<i>Alexgeorgea nitens</i>	
<i>Desmocladius flexuosus</i>	
<i>Hypolaena exsulca</i>	
<i>Lyginia barbata</i>	
RUBIACEAE	
<i>Opercularia vaginata</i>	

APPENDIX 1(Cont)

RUTACEAE	
<i>Eriostemon spicatus</i>	Pepper and salt
SANTALACEAE	
<i>Leptomeria empetrifomis</i>	
STYLIDIACEAE	
<i>Levenhookia stipitata</i>	Common stylewort
VIOLACEAE	
<i>Hybanthus calycinus</i>	Wild violet
XANTHORRHOEACEAE	
<i>Xanthorrhoea brunonis</i>	

APPENDIX 2

FLORA: INTRODUCED SPECIES	
BOTANICAL NAME	COMMON NAME
FLOWERING PLANTS	
AMARYLLIDACEAE	
<i>Amaryllis belladonna</i>	Belladonna lily
AIZOACEAE	
<i>Carpobrotus edulis</i>	Pigface
ASTERACEAE	
<i>Arctotheca calendula</i>	Cape weed
<i>Aster subulatus</i>	
<i>Conyza albida</i>	Tall fleabane
<i>Hypochaeris glabra</i>	Flat weed
<i>Osteospermum clandestinum</i>	Stinking Roger
<i>Sonchus oleraceus</i>	Common sowthistle
<i>Ursinia anthemoides</i>	Ursinia
<i>Vellereophyton dealbatum</i>	
BRASSICAEAE	
<i>Raphanus raphanistrum</i>	Wild radish
CAMPANULACEAE	
<i>Wahlenbergia capensis</i>	Cape bluebell
CARYOPHYLLACEAE	
<i>Petrorhagia velutina</i>	Velvet pink
<i>Silene gallica</i>	French catchfly
CYPERACEAE	
<i>Cyperus tenellus</i>	
<i>Cyperus tenuiflorus</i>	
EUPHORBIACEAE	
<i>Euphorbia peplus</i>	Petty spurge
<i>Euphorbia terracina</i>	Geraldton carnation weed
<i>Ricinus communis</i>	Castor oil plant
FABIACEAE	
<i>Lupinus mutabilis</i>	Pearl lupin
<i>Lupinus cosentinii</i>	Sandplain lupin
<i>Trifolium arvense</i>	Hare's foot clover
<i>Trifolium campestre</i>	Hop clover
<i>Trifolium tomentosum</i>	Woolly clover

APPENDIX 2 (Cont)

FUMARIACEAE	
<i>Fumaria capreolata</i>	Fumaria
GENTIANACEAE	
<i>Centaurium erythraea</i>	Common centaury
GERANIACEAE	
<i>Erodium botrys</i>	Wild geranium
IRIDACEAE	
<i>Freesia aff. leichtlinii</i>	Freesia
<i>Ferraria crispa</i>	Black flag
<i>Gladiolus caryophyllaceus</i>	Wild gladiolus
<i>Gladiolus undulatus</i>	
<i>Homeria flaccida</i>	One leaf Cape Tulip
<i>Romulea rosea</i>	Guildford grass
<i>Watsonia spp.</i>	
JUNCACEAE	
<i>Juncus bufonius</i>	Toad rush
<i>Juncus microcephalus</i>	
LOBELIACEAE	
<i>Monopsis simplex</i>	
LYTHRACEAE	
<i>Lythrum hyssopifolia</i>	Lesser loosestrife
MIMOSACEAE	
<i>Acacia cyclops</i>	
<i>Acacia iteaphylla</i>	Flinders Range wattle
<i>Acacia longifolia</i>	
<i>Acacia podalyriifolia</i>	
MYRTACEAE	
<i>Callistemon sp.</i>	Bottlebrush
<i>Chamelaucium uncinatum</i>	Geraldton wax
<i>Eucalyptus camaldulensis</i>	Red river gum
<i>Eucalyptus citriodora</i>	Lemon scented gum
ONAGRACEAE	
<i>Oenothera glazioviana</i>	Coast evening primrose
ORCHIDACEAE	
<i>Monodenia bracteata</i>	South African orchid

APPENDIX 2 (Cont)

OXALIDACEAE	
<i>Oxalis pes-caprae</i>	Soursob
<i>Oxalis purpurea</i>	Largeflower wood sorrel
PAPILIONACEAE	
<i>Erythrina caffra</i>	
<i>Lotus suavolens</i>	
<i>Trifolium angustifolium</i>	
<i>Trifolium arvense</i>	Hare's foot clover
<i>Trifolium campestre</i>	Hop clover
<i>Trifolium dubium</i>	Suckling clover
<i>Vicia sativa</i>	Common vetch
POACEAE	
<i>Aira cupaniana</i>	
<i>Avena barbata</i>	Bearded oat
<i>Briza maxima</i>	Blowfly grass
<i>Briza minor</i>	Shivery grass
<i>Cynodon dactylon</i>	Couch grass
<i>Ehrharta calycina</i>	Perennial veldgrass
<i>Ehrharta longiflora</i>	Annual veldgrass
<i>Eragrostis curvula</i>	Love grass
<i>Holcus lanatus</i>	Yorkshire fog grass
<i>Lagurus ovatus</i>	Hare's tail grass
<i>Lolium perenne</i>	Perennial ryegrass
<i>Paspalum dilatatum</i>	
<i>Pennisetum clandestinum</i>	Kikuyu
<i>Poa annua</i>	Winter grass
<i>Polypogon monspeliensis</i>	Annual beardgrass
<i>Sporobolus indicus</i>	Paramatta grass/Rat's tail grass
<i>Stenotaphrum secundatum</i>	Buffalo grass
<i>Vulpia myuros</i>	Rat's tail fescue
PRIMULACEAE	
<i>Anagallis arvensis</i>	Pimpernel
SOLANACEAE	
<i>Solanum americanum</i>	Glossy nightshade
ZYGOPHYLLACEAE	
<i>Tribulus terrestris</i>	Caltrop

APPENDIX 3
Goss Avenue Native Species List (April 2004)

GENUS	SPECIES		
<i>Acacia</i>	<i>pulchella</i>	<i>Lepidosperma</i>	<i>squamatum</i>
<i>Acacia</i>	<i>stenoptera</i>	<i>Lepidosperma</i>	<i>longitudinate</i>
<i>Acacia</i>	<i>saligna</i>	<i>Leptomeria</i>	<i>empetriformisc</i>
<i>Acacia</i>	<i>wildenowniana</i>	<i>Leschenaultia</i>	<i>floribunda</i>
<i>Adenanthos</i>	<i>cygnorum</i>	<i>Leucopogon</i>	<i>conostephioides</i>
<i>Alexgeorgea</i>	<i>nitens</i>	<i>Lomandra</i>	<i>hermaphrodita</i>
<i>Allocasurina</i>	<i>fraseriana</i>	<i>Lomandra</i>	<i>micrantha</i>
<i>Allocasurina</i>	<i>humulis</i>	<i>Macrozamia</i>	<i>reidlei</i>
<i>Anigozanthos</i>	<i>manglesii</i>	<i>Melaleuca</i>	<i>seriata</i>
<i>Astartea</i>	<i>aff. ascicularis</i>	<i>Melaleuca</i>	<i>thymoides</i>
<i>Banksia</i>	<i>menzesii</i>	<i>Melaleuca</i>	<i>preissiana</i>
<i>Banksia</i>	<i>attenuata</i>	<i>Melaleuca</i>	<i>thymoides</i>
<i>Banksia</i>	<i>illicfolia</i>	<i>Melaleuca</i>	<i>seriata</i>
<i>Borya</i>	<i>spp</i>	<i>Mesomelaena</i>	<i>psudostygia</i>
<i>Bossiea</i>	<i>ericarpa</i>	<i>Microtis</i>	<i>media</i>
<i>Calytrix</i>	<i>flavescens</i>	<i>Nuytsia</i>	<i>floribunda</i>
<i>Cassytha</i>	<i>spp</i>	<i>Pattersonia</i>	<i>occidentalis</i>
<i>Centella</i>	<i>cordifolia</i>	<i>Persoonia</i>	<i>saccata</i>
<i>Conostephium</i>	<i>pendulum</i>	<i>Petrophile</i>	<i>linearis</i>
<i>Conostylis</i>	<i>aculeata</i>	<i>Regelia</i>	<i>ciliata</i>
<i>Conostylis</i>	<i>setigera</i>	<i>Scavoela</i>	<i>repens var.</i>
			<i>repens</i>
<i>Conostylis</i>	<i>candicans</i>	<i>Stirlingia</i>	<i>latifolia</i>
<i>Dampiera</i>	<i>linearis</i>	<i>Tricoryne</i>	<i>eladtior</i>
<i>Dasypogon</i>	<i>bromeliifolius</i>	<i>Xanthorrhoea</i>	<i>bruonis</i>
<i>Davesia</i>	<i>physodes</i>		
<i>Davesia</i>	<i>triflora</i>	MISSING:	
<i>Desmocladius</i>	<i>flexuosa</i>	<i>Eriostemon</i>	<i>spicatus</i>
<i>Desmocladius</i>	<i>fasciculata</i>	<i>Nemcia</i>	<i>capitata</i>
<i>Dianella</i>	<i>spp</i>		
<i>Eremaea</i>	<i>pauciflora</i>		
<i>Eucalyptus</i>	<i>marginata</i>		
<i>Eucalyptus</i>	<i>spp</i>		
<i>Eucalyptus</i>	<i>callophylla</i>		
<i>Gompholobium</i>	<i>tomentosum</i>		
<i>Haemodorum</i>	<i>spicatum</i>		
<i>Hemiandra</i>	<i>pungens</i>		
<i>Hibbertia</i>	<i>hugellii</i>		
<i>Hibbertia</i>	<i>hypericoides</i>		
<i>Hovea</i>	<i>trisperma</i>		
<i>Hypocalymma</i>	<i>robusta</i>		
<i>Hypocalymma</i>	<i>angustifolia</i>		
<i>Hypolaena</i>	<i>exsulca</i>		
<i>Jacksonia</i>	<i>furcellata</i>		
<i>Johnsonia</i>	<i>pubescens</i>		
<i>Juncus</i>	<i>pallidus</i>		

APPENDIX 4

Curtin Primary School Native Plant List

<i>Acacia</i>	<i>pulchella</i>	<i>Pericalymma</i>	<i>ellipticum</i>
<i>Acacia</i>	<i>hugelii</i>	<i>Petrophile</i>	<i>linearis</i>
<i>Acacia</i>	<i>saligna</i>	<i>Platysace</i>	<i>compressa</i>
<i>Acacia</i>	<i>wildenowiana</i>	<i>Scavoela</i>	<i>repens</i> var. <i>repens</i>
<i>Adenanthos</i>	<i>cygnorum</i>	<i>Scholzia</i>	<i>involucrata</i>
<i>Alexgeorgea</i>	<i>nitens</i>	<i>Stirlingia</i>	<i>latifolia</i>
<i>Allocasurina</i>	<i>fraseriana</i>	<i>Tricoryne</i>	<i>eladtior</i>
<i>Allocasurina</i>	<i>humulis</i>	<i>Xanthorrhoea</i>	<i>bruonis</i>
<i>Banksia</i>	<i>menzesii</i>		
<i>Banksia</i>	<i>attenuata</i>		
<i>Banksia</i>	<i>illicfolia</i>		
<i>Bossiea</i>	<i>ericoarpa</i>		
<i>Calytrix</i>	<i>flavescens</i>		
<i>Conostephium</i>	<i>pendulum</i>		
<i>Conostylis</i>	<i>aculeata</i>		
<i>Dampiera</i>	<i>linearis</i>		
<i>Dasypogon</i>	<i>bromeliifolius</i>		
<i>Davesia</i>	<i>physodes</i>		
<i>Davesia</i>	<i>triflora</i>		
<i>Desmocladus</i>	<i>flexuosa</i>		
<i>Desmocladus</i>	<i>fasciculata</i>		
<i>Dianella</i>	<i>revoluta</i>		
<i>Eremaea</i>	<i>pauciflora</i>		
<i>Eucalyptus</i>	<i>marginata</i>		
<i>Eucalyptus</i>	<i>todtiana</i>		
<i>Eucalyptus</i>	<i>callophylla</i>		
<i>Gompholobium</i>	<i>tomentosum</i>		
<i>Hemiandra</i>	<i>pungens</i>		
<i>Hibbertia</i>	<i>racemosa</i>		
<i>Hibbertia</i>	<i>hugellii</i>		
<i>Hibbertia</i>	<i>hypericoides</i>		
<i>Hovea</i>	<i>trisperma</i>		
<i>Hypocalymma</i>	<i>robusta</i>		
<i>Hypolaena</i>	<i>exsulca</i>		
<i>Jacksonia</i>	<i>furcellata</i>		
<i>Kennedia</i>	<i>prostrata</i>		
<i>Lepidosperma</i>	<i>squamatum</i>		
<i>Leschenaultia</i>	<i>floribunda</i>		
<i>Leucopogon</i>	<i>conostephioides</i>		
<i>Lomandra</i>	<i>micrantha</i>		
<i>Lyginia</i>	<i>barbata</i>		
<i>Melaleuca</i>	<i>seriata</i>		
<i>Microtis</i>	<i>media</i>		
<i>Nuytsia</i>	<i>floribunda</i>		
<i>Pattersonia</i>	<i>occidentalis</i>		

APPENDIX 5

COSTING FOR SPRAYING GRASSES

The use of Fluazifop at 4 Ltr per hectare over this area would cost approximately \$4,400. Should this total cost be prohibitive, portions of 1 hectare, (\$1,100 each) beginning in the south west corner, being 3.9 h.a.

Appendix 6

Phytophthora Dieback Management Procedures for Bushland Reserves Provided by the Dieback Working Group

Timing	<ul style="list-style-type: none"> Activities such as fire break maintenance, slashing and removal of woody weeds to occur in dry soil conditions ie. scheduled between November and March and postponed during and following rainfall.
Bushland Restoration Activities	<ul style="list-style-type: none"> <u>Weeding</u> - If weeds are being manually removed, they should be immediately placed in a container, so plant material or soil is not dropped into other parts of the reserve or other reserve areas. <u>Revegetation</u> - If revegetation is required: <ul style="list-style-type: none"> Consider direct seeding rather than planting seedlings. Purchase plants from nurseries with Wholesale Accreditation from the Nursery Industry Association, or nurseries with excellent hygiene procedures. Community groups completing revegetation activities should be advised to do the same. If moving from one part of a bushland reserve to another, or from an infested area to uninfested, ensure all machinery, tools and equipment are free of mud and soil. If using mulch, ensure that it has been well composted (the heating part of the composting process kills <i>P. cinnamomi</i>).
Access	<ul style="list-style-type: none"> Off road vehicles, motorcycles and horses to be kept out of bushland reserves. Minimise the number of tracks in bushland reserves, and ensure that they have hard, dry and well drained surfaces. Avoid entering bushland reserves when the soil is wet and muddy, and stay on the tracks. Visitors to bushland reserves are to ensure that their footwear is free of mud and soil. <u>When constructing a track;</u> <ul style="list-style-type: none"> Construct in dry soil conditions. Ensure all machinery and tools used are free of <i>P. cinnamomi</i>. Consider constructing wooden walkways over muddy areas. Materials that can be used to construct tracks include: gravel that is free of <i>P. cinnamomi</i>, concrete, limestone or woodchips.
Fire Protection Activities	<ul style="list-style-type: none"> Mow, slash or use herbicide on fire breaks, rather than plough or grade. When maintaining breaks by grading, do not grade wider than the existing graded area.
Soil Movement	<ul style="list-style-type: none"> Minimise soil disturbance; mow, slash or use herbicide rather than grade or plough. If soil, gravel, sand etc. is to be imported into a bushland reserve, these materials are to be sourced from a supplier who is accredited by the Nursery Industry Association to ensure they are free of <i>P. cinnamomi</i>. Do not dump plant material or soil in bushland reserves.
Vehicles, Machinery and Tools	<ul style="list-style-type: none"> All machinery and vehicles (including small tractors, ride on mowers, slashers and utes) to be free of mud and soil on tyres, mudflaps, body and underbody when entering a bushland reserve, when moved into <i>P. cinnamomi</i> free areas, and when moved from one bushland reserve to another. All tools and equipment (including shovels, spades and trowels etc.) to be free of mud and soil when entering a bushland reserve, when moved into <i>P. cinnamomi</i> free areas and when moved from one bushland reserve to another.
Water Management	<ul style="list-style-type: none"> Any water used in the bushland reserves to be from scheme or bore supply, or sterilised. Do not discharge drainage water into bushland reserves.
Roadsides	<ul style="list-style-type: none"> Slashers, tractors and other equipment used on roadsides to be washed down daily when operating in bushland areas.

Appendix 7

Implementation Schedule

No.	Recommendation	Priority	Approx. Cost
5.1	ZONING AND NAMING		
5.1.1	Council to formalise naming of the Goss Avenue bushland (COSP);	H	\$200
5.1.2	Encourage Koonawarra Primary School – Education Department of Western Australia to formally name their bushland (EDWA);	H	\$50
5.1.3	When names have been approved, information signs should be placed in visible parts of each bushland section (EDWA/COSP).	H	\$350 (COSP) \$350 (EDWA)
5.2	AMENITY AND PUBLIC ACCESS		
5.2.1	The bushland sites should be managed for passive recreation only (EDWA/COSP);	O	–
5.2.2	Maintain the present program of summer verge mowing (see also Rec. 5.3.4) (COSP);	O	–
5.2.3	Liaise with the local community to ascertain which pathways in each site are the most used and useful. Close down and rehabilitate excess pathways (see also Rec. 5.3.3) (EDWA/COSP);	H	\$2,000
5.2.4	Lay and roll crushed limestone (or similar porous material) on remaining pathways in the Goss Avenue site (COSP);	M	\$4,000
5.2.5	Construct a pathway along the eastern boundary of the Goss Avenue bushland (COSP);	M	\$3,000
5.2.6	Construct a 1.2m post and rail fence along the western boundary of the Koonawarra bushland (EDWA);	H	\$5,000 (EDWA)
5.2.7	Install bollards along the internal boundary of the Koonawarra school bushland (EDWA);	H	\$2,000 (EDWA)
5.2.8	Following path rationalisation in the Goss Avenue site, install a 1.2m post and rail fence to replace the existing post and rail fence. Remove the high steel and chain-mesh fence (COSP);	H	\$7,500 (fence) \$200 (removal)
5.2.9	Remove all dumped materials from each bushland site (EDWA/COSP);	M	\$800
5.2.10	Erect signs to educate residents, reminding them not to dump materials in the bushland or pick wildflowers (EDWA/COSP).	H	\$150
5.3	FIRE MANAGEMENT		
5.3.1	Encourage local residents to exercise vigilance over the bushland sites and to report any suspicious activities or fires immediately to the appropriate authorities (COSP);	O	\$500
5.3.2	Maintain a register of fire outbreaks in the bushlands (COSP);	O	In house
5.3.3	Designate and develop suitable pathways as dual purpose firebreaks in Goss Avenue bushland (COSP);	H	(see rec. 5.2.3)

5.3 cont. 5.3.4	Ensure that the first verge mowing occurs in spring (September) to reduce fire hazard (see also Rec. 5.2.2) (COSP);	O	Already in works program
5.3.5	Implement a Veld Grass spraying program within each bush reserve to reduce fuel loads (COSP/EDWA);	H	\$3,200/yr (COSP) \$1,500/yr (EDWA)
5.3.6	Revise the fire management strategy, developed with the Kensington Fire Brigade, in line with the implementation of this management plan (COSP/KFB).	O	In House
5.4	FERAL AND DOMESTIC ANIMALS		
5.4.1	Support and enforce the existing designation for the Goss Avenue bushland under the Local Law Relating to Dogs. Appropriate signage should be erected (COSP);	M	\$200
5.4.2	Monitor the site regularly for the presence of feral species (COSP);	O	\$250/yr
5.4.3	Support any moves by City of South Perth to educate residents about responsible cat ownership (COSP).	O	—
5.5	REHABILITATION		
5.5.1	Develop a weed control program for the bushlands utilising manuals denoted in the text. This program should detail action at the most appropriate time of the year for individual weeds (COSP);	H	\$1,000
5.5.2	Reduce the ingress of surrounding mowed areas into the bushlands by clear designation of boundaries. This should apply specifically to the eastern and southern boundaries of the Goss Avenue bushland and the north-western corner and internal boundaries of the Koonawarra school bushland (EDWA/COSP);	H	\$3,000
5.5.3	Investigate the potential of utilising direct seeding or smoke techniques to revegetate parts of the bushland where natural regeneration alone will not suffice (COSP);	M	New technology
5.5.4	All plantings/direct seeding should be species representative of the vegetation complex, from seed collected either within the reserve or from nearby bushland (EDWA/COSP);	O	—
5.5.5	Plant <i>Corymbia callophylla</i> along the bank on the eastern side of the Goss Avenue bushland (COSP);	M	\$500
5.5.6	Select sedge/rush species for drain planting on the southern bank of the drain from those listed as endemic to banksia sumplands, but also capable of taking up nutrients (COSP);	M	\$1,000
5.5.7	Liaise with the Water Corporation to ensure that proposed drain plantings and any propose works are consistent with their objectives (COSP).	M	\$100

5.6	COMMUNITY INVOLVEMENT AND EDUCATION		
5.6.1	Encourage local residents to form a "friends" group to care for the bushlands (COSP);	M	\$500
5.6.2	Invite a local school or schools to adopt the Goss Avenue bushland and become involved with its management and rehabilitation (COSP);	M	\$500
5.6.3	Encourage Koonawarra Primary School to actively involve themselves in the care and maintenance of the school bushland (COSP).	H	\$200
6.1	FACILITATION		
6.1.1	Encourage and advise community based organisations to become incorporated and how to successfully apply for grant monies (COSP);	M	\$200
6.1.2	Ensure adequate funding is provided by Council to conduct a staged implementation of this management plan (COSP);	H	–
6.1.3	Seek support from the Education Department of Western Australia for funds to implement the recommendations relevant to the Koonawarra bushland (COSP).	H	\$100
6.2	PRIORITY AND REVIEW		
6.2.1	Implement recommendations as per assigned priority;	–	–
6.2.2	Review this management plan on or before the year 2005 (COSP).	–	\$5,000 (total cost)