



KEYWORD

**INTERIM GUIDELINES FOR NECESSARY OPERATIONS
FOR**

WOODVALE NATURE RESERVE NO. 30809

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FOREWORD

These Interim Guidelines for Necessary Operations for Woodvale Nature Reserve have been prepared in accordance with directives contained in Administrative Instruction No. 23 of the 28th November 1986. It is proposed that these interim operational guidelines will remain in force over the period 1991-1996 in order to allow the management of the 39 ha. Woodvale Nature Reserve to proceed in an orderly fashion.

The reserve is currently vested in the Executive Director of CALM and does not, therefore, fit into the categories of land (listed in Section 5 of the CALM Act) to which the CALM Act itself applies. It is anticipated that the accumulation of data arising from the management operations over the period 1991-1996 will be taken into consideration during the preparation and submission of a final management plan for Woodvale Nature Reserve.

ACKNOWLEDGEMENTS

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Mrs J. Rayner and Mrs R. Hick our clerical officers have, once again, demonstrated their skills in their typing and interpretation to produce this document, I extend my grateful thanks to these two officers for their competency in the preparation and presentation of this manuscript.

ABBREVIATIONS

Dir. Res	- Director Research
SPRS	- Senior Principal Research Scientist
CALM	- Conservation and Land Management
W.A.F.B.	- Western Australian Fire Brigade
CFW	- Chief Fire Warden
V.H.F.	- Very High Frequency
V1 V2 V3	- Water Sprinkler Valves 1, 2 and 3
4WD	- Four Wheel Drive

- Lab - Laboratory
- APB - Agricultural Protection Board
- WAWRC - Western Australian Wildlife Research Centre
- WRC - Wildlife Research Centre
- FTE - Full Time Employee

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WOODVALE NATURE RESERVE NO. 30809

Author: Sokolowski R.

1. DESCRIPTION

1.1 Preamble

Since the establishment of Woodvale Nature Reserve in 1973 the ongoing urban sprawl within the Metropolitan area has rapidly spread into the planned Northern Corridor - an urban development Town Planning Scheme for new growth areas on the periphery of Perth.

The Mitchell Freeway, which now runs along the western boundary of the reserve is presently being modified to carry the new rapid rail transport system. It is expected to reach Woodvale in 1993. New residential areas are being established along the southern boundary and development proposals are at the planning stage for further residential and recreational areas along the eastern boundary. The northern boundary fronts a four-lane highway. This urbanization has impacted upon the nature reserve and could pose a long-term threat to the general condition and security of the reserve.

1.2 Location and Tenure

In March of 1970, the Minister for Fisheries and Fauna gave approval for the building of a new Research Centre for the Department of Fisheries and Fauna. A number of locations were considered including sites at Kewdale, Armadale, Thomsons Lake and Whiteman Park. A final decision was made to establish a new Wildlife Research Centre on an existing Flora Reserve Swan Loc. 7812 in the Shire of Wanneroo. In February 1971, this area of 39 ha was set aside for Research and Conservation of Flora and Fauna and vested in the Minister for Fisheries and Fauna in the Government Gazette of 8th April 1971.

A contract for \$139 912 was let in February 1973 for the building of the new Research Centre which was occupied by staff in August 1973. On March 6, 1974 the Research Centre was officially opened by His Royal Highness, Prince Philip, Duke of Edinburgh, in company with the Honourable A.W. Bicton, MLA, Minister for Housing, Fisheries and Fauna and the North-West.

An extension was added to the building in 1984 at a cost of \$1 091 706 and occupied by staff in 1985. In November 1985 the Research Centre and research staff amalgamated with the Forests Department and National Parks Authority to form the new Department of Conservation And Land Management. In Government Gazette 111 of the 20th November 1987 the Reserve,

which had been set aside for Research and the Conservation and Flora and Fauna was vested in the Executive Director of the Department of Conservation And Land Management.

1.3 Topography, Soils and Climate

The reserve is on undulating dunes on the Swan Coastal Plain some 6 km east of the Indian Ocean. It is located on the Gnangara Mound a major water supply reserve covering an area of 2165 km² (Western Australian Government Gazette 1973) within the Spearwood Dune System on the west side of Lake Joondalup. Soil type is grey sand over yellow sand with limestone and clay formations at depth. Average rainfall is 870 mm in the mediterranean climate of cool, wet winters and hot, dry summers with 90 percent of the annual rainfall occurring during the period May to September. (Commonwealth Bureau of Meteorology, 1969).

1.4 Flora

The Reserve presently contains some 200 species of plants from 45 of the 153 families in the Perth region. (Appendix 3) The major tree species on the Reserve are *Eucalyptus gomphocephala* Tuart, *Eucalyptus marginata* Jarrah, *Eucalyptus calophylla* Marri, *Allocasuarina fraseriana* over *Banksia attenuata*, *Banksia grandis*, *Banksia menziesii* and *Banksia prionotes*. Thirty-two of the 200 plant species recorded on the Woodvale Nature Reserve are naturalized weedy species and some are a cause of major concern. Some 22 species of orchids have been recorded on the Reserve and these, together with the other native species, illustrate a species richness indicative of the local area undisturbed by urban development.

1.5 Birds

72 bird species have been recorded on the reserve consisting of 32 vagrants and irregular visitors, 12 regular visitors and 28 species either resident or present throughout the year. (Appendix 2) Some 25 species have been recorded feeding on the reserve, but it is expected that further observations will add to this number. The numbers present at any one time would vary in accordance with climatic conditions and other factors which affect bird movements. The Reserve offers a refuge area for transitory species and breeding habitat for common and uncommon residents and regular visitors. The tall tuarts have nesting hollows which support large numbers of Port Lincoln Ringneck Parrots.

1.6 Mammals

In 1975, a link mesh wire fence with an electric pulsating wire at the top was erected around the boundary and in consequence, a number of native fauna were trapped within the Reserve including the Western Grey Kangaroo, Western Brush-Wallaby and Brush-tailed Possum. (Appendix 1) By 1989, the Western Grey Kangaroo population numbered 27 animals and was considered to be far too many for the area. A program to relocate all these animals commenced towards the latter end of 1989 and will eventually terminate with a zero population in 1991/92 .

1.7 Reptiles and Amphibians

There have been no major trapping surveys for reptiles and/or amphibians on this Nature Reserve although occasional sampling has resulted in 14 species of lizards, 4 snakes and 3 species of frogs being recorded. (Appendix 1)

1.8 Past History and Present Use

The Reserve is the base for the Research Centre staff who carry out conservation research throughout the State. There is a Resident Ranger whose main duties are to provide security, undertake management works such as firebreaks, pest control, design and manufacture simple items of field equipment for research staff and to carry out general building and ground maintenance. The Ranger also assists with captive-breeding programs and attends to the feeding of these animals out of normal office hours.

Two captive-breeding programs have taken place, i.e. the Numbat and the Western Swamp Tortoise. Earlier studies on captive kangaroos ceased some years ago. Plant propagation trials have taken place in the plant breeding enclosure and local seeds have been propagated to assist in rehabilitation programs within specific areas of the Reserve.

Bore water was the main source of supply until 1985 when scheme water was brought into the Centre. The Centre is still on a septic system and it is intended to connect into a sewer main when this service becomes available with newly proposed urban development on the eastern boundary of the reserve.

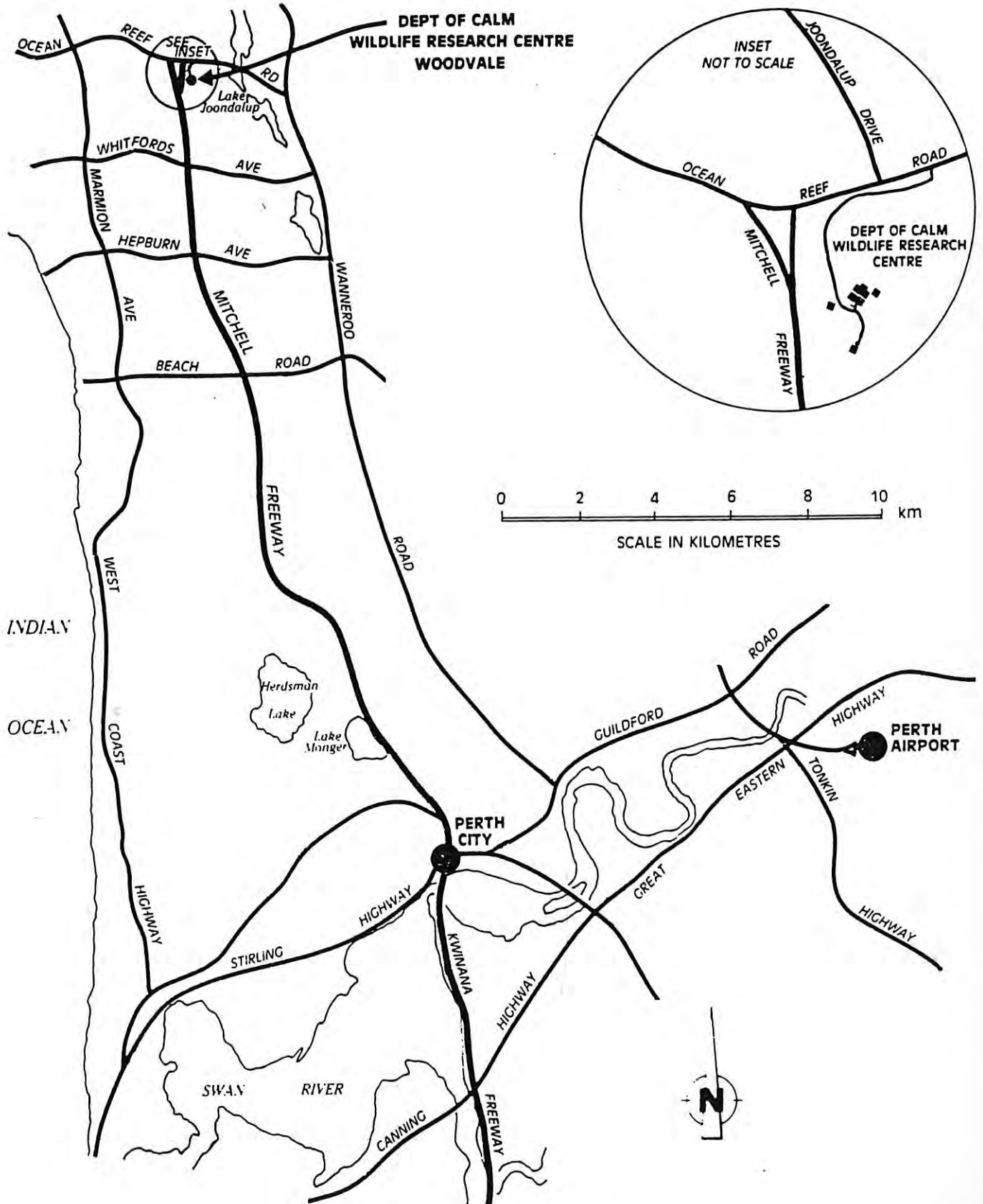
1.9 Management Responsibility and Function

The function of management will be to determine achievable objectives in order to effectively manage the Reserve. The responsibility for achieving these goals will be for the Research Centre Manager working through established planning procedures, utilising available resources

and obtaining external assistance from other divisions of CALM. The recommendations contained in these Interim Guidelines will be the tool to achieve this aim.

WILDLIFE RESEARCH CENTRE - WOODVALE

LOCALITY MAP



2. GENERAL MANAGEMENT OBJECTIVES

Author: Sokolowski R.

2.1 Objectives

The primary objective is to protect life and property and as far as possible to retain, in perpetuity, the conservation value and areas of scientific importance within the remnant coastal Tuarts and associated areas of banksia, jarrah and casuarina woodland.

2.2 Fire Protection

Fire suppression and recommended control procedures will be undertaken to assist in protecting life and property in the centre and that of the adjoining property holders in order to satisfy the regulations of the Bush Fires Act (1954) and amendments.

2.3 Plant Diseases Protection

Recent test trials have confirmed that *Phytophthora nicotianae* var. *nicotianae* is present on the nature reserve. The objective of Management is to prevent further introduction of plant diseases and to minimise the spread of existing infections.

2.4 Weeds

A major problem in the reserve are the exotic weeds which were established when the land, for the Research Centre, was taken up in 1973 or have been introduced by natural causes i.e. wind, animals and/or human activity. The object of management will be to contain the spread of weeds within the nature reserve and in the long term eradicate major weed species i.e. *Homeria flaccida*, *Phytolacca octandra* and others.

2.5 Exotic/Feral Animals

The major feral animals on the wildlife nature reserve are foxes, rabbits and the feral cat. It is anticipated that local domesticated cats will also attempt to use the reserve as a hunting area and their eradication will need to be strictly maintained. The major objectives in control of exotic/feral animals is to implement effective and economic eradication on a continuing basis for the protection and conservation of fauna.

2.6 Facilities & Access Management

The issue of access management concerns maintaining reasonable access to the Reserve and the facilities thereon to Woodvale staff and *bona fide* workers from other sections of the community while preserving the security and integrity of the Reserve and its assets and other values.

2.7 Rehabilitation

Rehabilitation will be carried out on areas which have been disturbed. At all times seeds will be used from plant species growing on the reserve, no soils will be introduced.

2.8 Library

The management objective is to continue to provide a specialist branch library at Woodvale Research Centre.

2.9 Conclusion

A number of achievable goals will form the basis of the Interim Guidelines for Management in order to protect life and property and as far as possible conserve, protect, restore areas of scientific importance and to promote an appreciation of the natural processes and attributes of Woodvale Nature Reserve.

3. FIRE PROTECTION

Authors: Burrows N., Friend G., Maisey K., Mitchell D., Churches M., Rowlands G., Muir B., Brown A.

3.1 Introduction

Fire has a long association with south-west ecosystems, pre-dating the arrival of Europeans by many thousands of years (Hallam 1975). Hot, dry summers, flammable vegetation and lightning or human ignition ensured the regular occurrence of bushfires across the landscape. Consequently, native flora and fauna exhibit a range of behavioural and physical fire adaptive traits (Gill *et al.* 1981).

With European settlement and the establishment of farms, towns and sawmilling, bushfires became a problem as they posed a threat to human life and property (McCaw and Burrows 1988). Today, fire managers aim to develop strategies to protect human life and property and conservation values from intense and damaging wildfires, while at the same time, protecting and enhancing the integrity of natural bushland. These aims are not always compatible and strategies to achieve both are sometimes controversial. Management is further constrained by lack of knowledge, limited resources, and a range of other factors (see Burrows *et al.* 1989).

The Woodvale Nature Reserve is a relatively small reserve surrounded by homes and other urban developments. Fire management on this reserve is further complicated by the presence of a permanent CALM Research Centre within the Reserve which consists of about 55 people who are on site during business hours, a Resident Ranger and family who live permanently on the reserve and buildings, plant and equipment.

3.2 Legislative responsibilities

Fire management on the reserve must comply with

- i) Bushfires Act (1954) and amendments,
- ii) Fire Brigades Act (1942) and amendments,
- iii) Wildlife Conservation Act (1950-1979),
- iv) Conservation and Land Management Act (1984) and,
- v) Occupational Health and Safety Act (1984) and Regulations 1988.

The reserve was gazetted primarily to house the existing Research Centre and to preserve an example of coastal tuart/jarraah/banksia woodland which is fast disappearing in the wake of urban development.

3.3 Fire history

The early history of fire in these ecosystems is not well documented, but what is known is summarised by Hallam (1975). The coastal woodland vegetation was probably burnt regularly by Aborigines to maintain an open woodland. Evidence suggests that Aborigines mostly fired the vegetation from December to April and as often as it would carry fire (probably every 4-10 years) Hallam (1975). With the exception of prescribed burning in the last 4-5 years, the recent history of fire in the reserve is not known. The area was probably burnt by intermittent summer wildfire at 5-20 year intervals. Today, there are small patches in the reserve which have not been burnt for about 15-20 years.

Narrow fuel reduced buffers were established using prescribed fire over the period 1987-1991. Buffers were established on the northern and eastern boundaries of the reserve and around the buildings.

3.4 Fire management aims in order of priority

- i) To protect human life and property, both within and adjacent to the reserve, from destruction or damage by bushfire.
- ii) To maintain the conservation and aesthetic qualities of the reserve without unduly compromising the first aim.

Prior to developing strategies to achieve the above aims, it is necessary to examine the threat posed by wildfire in the Woodvale Nature Reserve.

3.5 Wildfire threat analysis

Analysis of wildfire threat has three components:

- i) the risk of a wildfire occurring,
- ii) the values threatened or at risk, and
- iii) the suppression capability.

3.5.1 Wildfire risk

This is a function of the risk of ignition, and fuel and weather conditions conducive to fire spread. The risk of ignition from lightning strike is LOW, based on known history of fire causes along the coastal plain and on the small size of the reserve. However, the risk of ignition by humans, either deliberate or accidental, is MODERATE to HIGH and increasing with increasing residential development along the reserve boundary. Children have been a major cause of bushfires in the Metropolitan Region. The regular firing of remnant bushland has encouraged grass and weed invasion, creating an annual fire risk and reducing the diversity of native flora.

Fuels will re-accumulate sufficiently following fire to a flammable state within 3-4 years (Burrows and McCaw 1990). Fire intensity, therefore the damage potential of the fire and difficulty of control, will depend on fuel quantity (or time since last fire), fuel dryness and weather conditions (Cheney 1981). Fuel quantity plateaus in this vegetation 6-10 years after fire.

Weather conditions conducive to the start and rapid build-up of fire occur annually from November to April. Typical of the "fire season" are hot days with low humidities, strong overnight and early morning easterly winds and afternoon sea breezes from the west and south west. The most serious fire weather conditions occur with the (unpredictable) easterly movement of low pressure troughs following periods of rising temperatures and low humidities. Winds back from the NE to NW and there is associated atmospheric instability giving rise to thunderstorms, lightning and erratic fire behaviour on the leading edge of the trough.

On average there will be about 110 days each year of HIGH fire danger, 26 days of VERY HIGH fire danger and 5 days of EXTREME fire danger (Robley 1983).

3.5.2 Wildfire as a hazard

Values at risk of being damaged or destroyed by wildfire are, in order of priority;

- i) human life, within and adjacent to the reserve;
- ii) property including buildings, homes, plant and equipment,
- iii) degradation of the conservation and aesthetic values of the reserve.

Values at risk are characterised as EXTREMELY HIGH.

3.5.3 Suppression capability

Wildfires on the reserve are likely to be detected rapidly given the high human presence on and near the reserve.

The buildings within the reserve are equipped with roof and perimeter sprinklers and fire alarms, which, if activated early enough, will provide a degree of protection to buildings and occupants. There is a network of stand pipes and hydrants around the buildings, a fire emergency procedure, a first attack capability by way of a light fire fighting unit, and good communications with W.A.F.B. and CALM fire crews at Wanneroo. The response time by emergency services is 10-15 minutes although this may be longer if emergency services are fully committed elsewhere.

The fire suppression capability can be characterised as VERY HIGH (Figure II).

3.6 Fire management strategy

This strategy places emphasis on detection, suppression and fire emergency training as the key to wildfire protection. The strategy is not designed to completely prevent wildfires on the reserve; there will always be the risk of a wildfire on the reserve. The strategy is to ensure that wildfires are quickly suppressed and do not cause property damage or loss of life.

3.6.1 Protection of human life and property

The Research Centre buildings are set in the bush but are not particularly well designed to cope with wildfire. Bushfires set fire to buildings by either spot fires from flying embers which lodge in flammable materials outside or inside the building or by direct flame contact. Buildings can be made safe by following basic design rules (see Webster 1986 for details). It is beyond the scope of this plan to discuss in detail safe building and design techniques. It is also impractical and unnecessary to make expensive structural changes to the existing buildings.

- i) Wood has been used extensively in sun decks, verandahs and walkway rafters. It is important that these areas are kept clear of flammable material such as leaf litter, large trees and shrubs for a distance of at least 2 metres in the court yard areas. The space beneath sun decks must be cleared regularly. Spark arresters of simple metal fly screen mesh should be placed around the base of sun decks and other flammable structures where embers can lodge. Gutters should be removed or kept clean. Plastic skylights are ready access points for flying embers and thought should be given to placing spark arresters over the skylights during the fire season.

- ii) The buildings (including vehicle compounds) and storage facilities for flammable material such as petrol, diesel and gas should be clear of all flammable debris such as leaf litter, logs and dead vegetation including trees, for a distance of 10 metres. It is worth noting that the petrol bowser and underground storage facility is directly up hill of the main building, posing a serious threat in the event of a major spill or tank rupture. Consideration should be given to re-locating this facility. Low maintenance, non-flammable, low ground cover vegetation should be established in court yards and near buildings in preference to large jarrah trees and native shrubs.
- iii) Overhead power lines servicing the building should be placed underground or kept clear of trees.
- iv) Maintain existing access, firebreaks, tracks and emergency exit routes.
- v) Maintain existing system of fuel reduced buffers around the perimeter of the reserve (see Figure 1) using a combination of prescribed burning, chemical spraying and mechanical reduction or removal of fuel. The purpose of this is to reduce the risk of fire entering or leaving the reserve. Homes on the reserve boundary are vulnerable to fires originating on the reserve so firebreaks and buffers need to be maintained. Frequent burning will increase grass and weed invasion so combinations of the above methods are recommended.
- vi) Maintain existing fire emergency procedures and standing orders (see Appendix 4.). Regular training and fire emergency drills to be conducted at the beginning of the fire season and every 2 months during the fire season. All staff must be trained in fire safety and emergency procedures.
- vii) Maintain and test existing sprinkler and fire alarm systems. On weekends and public holidays when the fire danger is rated as VERY HIGH or EXTREME, sprinklers should be turned on for a minimum of 30 minutes at 0900 hours and 1500 hours.
- viii) Maintain a presence on the reserve during the fire season either by way of a Ranger or by a duty roster of research staff.
- ix) The research centre must be capable of mounting a first attack, independent of W.A.F.B and CALM fire crews. Time is vital in wildfire suppression and Centre staff must be trained and equipped to respond immediately to deal with a wildfire outbreak until emergency services arrive. A crew of about 10 people should be trained in fire

suppression and in the use of fire fighting equipment through Fire Branch training schools. Staff must be capable of protecting their own work place.

- x) Fire hydrants and access ways to the hydrants should be kept clear of flammable debris.
- xi) Car parks should be clear of trees and other flammable material. During a fire emergency, it will be a natural reaction of staff to be concerned for the safety of their private vehicles.
- xii) During a bushfire emergency and after mustering, staff should patrol designated sections of the building with a pack spray or fire extinguishers to douse any embers landing on or inside the building. Staff should not evacuate the reserve unless directed to by emergency services. Remaining in or around the buildings is not only the safest place to be but will also ensure that the buildings will be saved. Unlike a bushfire which will sweep through in a matter of a few minutes, buildings burn very slowly.
- xiii) Liaise regularly with neighbours and with CALM Metropolitan and Wanneroo offices. While urban development may increase the risk of ignition, co-operative neighbours can also assist with the bushfire problem.

3.6.2 Protecting conservation and aesthetic values

Given the small size of the reserve and the very high detection and suppression capability, it is not necessary to frequently prescribe burn the entire reserve. Such a strategy will result in severe grass and other weed invasion, further aggravating the fire problem. However, it is necessary to maintain the existing low fuel buffers using a combination of fire, chemical spraying and mechanical fuel reduction and removal.

Prescribed burning for ecological reasons (such as to regenerate specific species) may be necessary from time to time but this assessment should be made based on information obtained from the monitoring sites. Until there is a clear need, disturbance of any kind in this small, remnant reserve should be minimised.

3.7 Fire research

Researching the effects of fire on this reserve is a low priority. Fire research resources are limited. Post-fire monitoring sites established in similar vegetation in the Yanchep National Park

will provide information applicable to this reserve. It may be appropriate to monitor invertebrates and herpotofauna.

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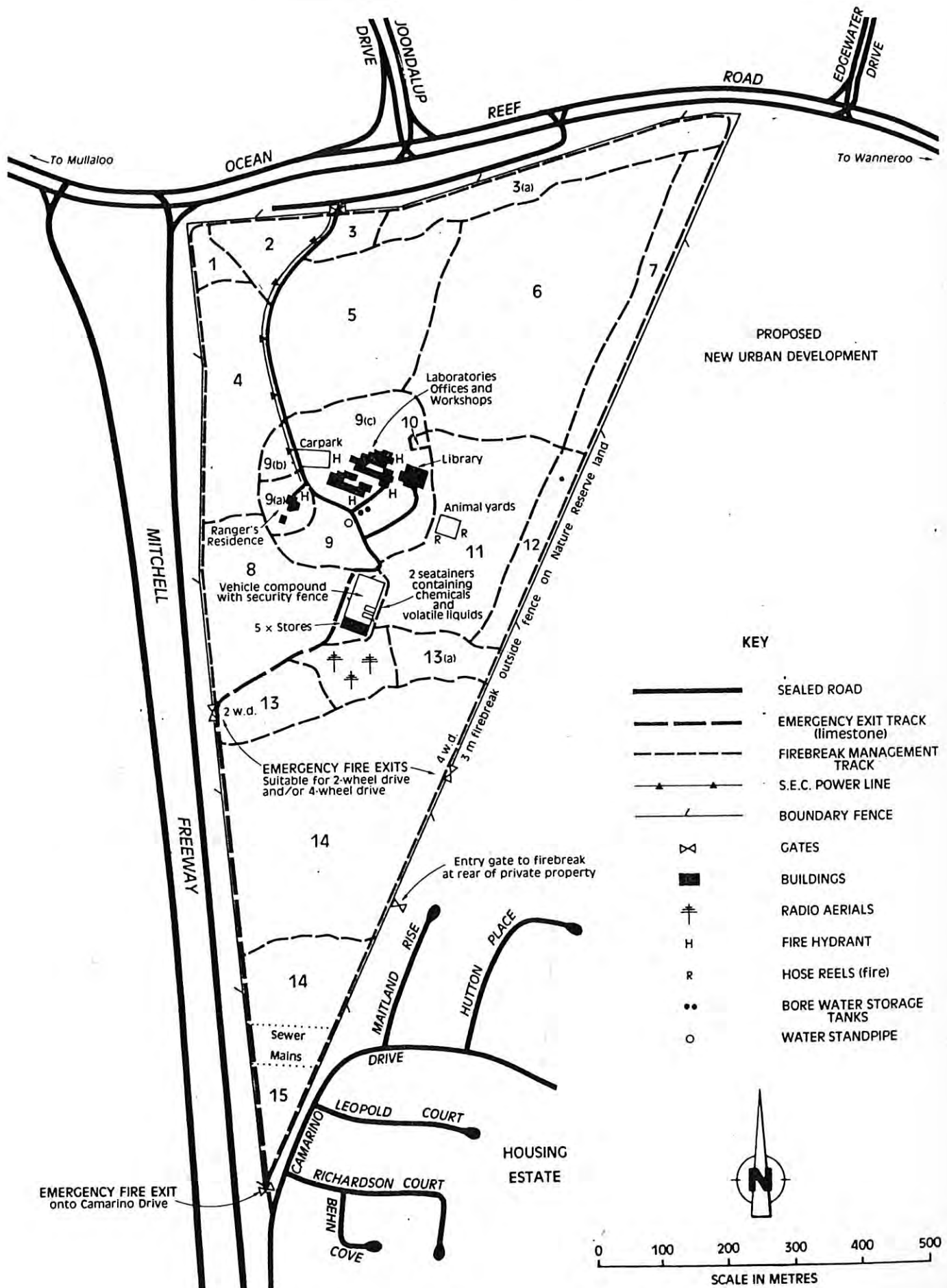
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Attachments:

FIGURE 1: Plan of Woodvale Nature Reserve showing firebreaks, access tracks, buffers.

FIGURE 2: Fire Fighting Appliances Plan of buildings, sprinklers and hydrants.

RESERVE No 30809 WOODVALE NATURE RESERVE
WILDLIFE RESEARCH CENTRE



WILDLIFE RESEARCH CENTRE WOODVALE

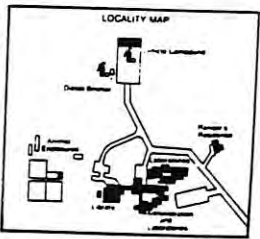
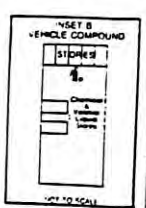
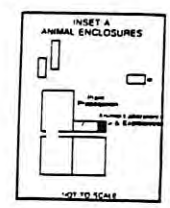
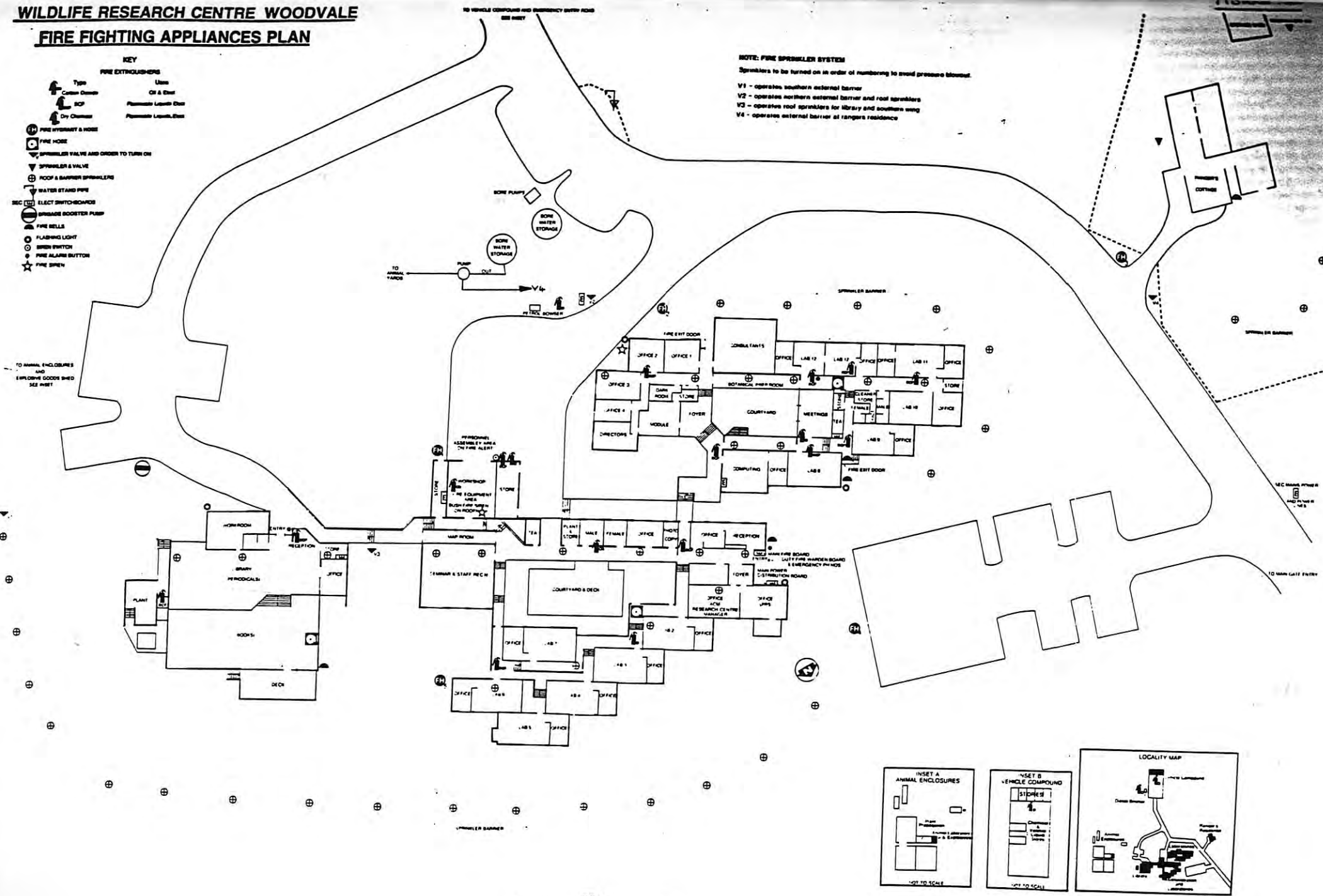
FIRE FIGHTING APPLIANCES PLAN

KEY

- FIRE EXTINGUISHERS**
- | | |
|----------------|------------------------|
| Type | Uses |
| Carbon Dioxide | Oil & Gas |
| BCP | Flammable Liquid Class |
| Dry Chemical | Flammable Liquid, Gas |
- FIRE SYSTEMS & HOSES**
- ☉ FIRE HOSE
 - ☉ SPRINKLER VALVE AND ORDER TO TURN ON
 - ☉ SPRINKLER & VALVE
 - ☉ ROOF & BARRIER SPRINKLERS
 - ☉ WATER STAND PIPE
 - ☉ ELECT SWITCHBOARD
 - ☉ SPRINKLER BOOSTER PUMP
 - ☉ FIRE BELLS
 - ☉ FLASHING LIGHT
 - ☉ BUSH SWITCH
 - ☉ FIRE ALARM BUTTON
 - ★ FIRE SIREN

NOTE: FIRE SPRINKLER SYSTEM
 Sprinklers to be turned on in order of numbering to avoid pressure blowout.

V1 - operates southern external barrier
 V2 - operates northern external barrier and roof sprinklers
 V3 - operates roof sprinklers for library and southern wing
 V4 - operates external barrier at rangers residence



SCALE
 0 5 10 20 METERS

4. PLANT DISEASE PROTECTION

Authors: Shearer B., Mitchell D.

4.1 Introduction

Plant diseases of most concern to the Woodvale Nature Reserve are those caused by canker fungi, *Phytophthora* and *Armillaria* species.

The impact of *Phytophthora* species in tuart woodland is generally low, despite the presence of many susceptible plant species. The reasons for this are not known. Thus prevention of introduction and spread of *Phytophthora* must be a high priority.

A number of *Banksia* sp. deaths were observed on the reserve in 1990 and four samples were taken from these trees to test for the presence of *Phytophthora*. Three of these tests have shown negative and the fourth returned positive results of *Phytophthora nicotianae* var. *nicotianae*.

Although this species is not frequently found in native plant communities it can be as aggressive as *P. cinnamomi*.

Phytophthora are spread by disturbance and movement of soil, particularly by heavy earthworks, by vehicles and even from foot traffic (including fauna). Spread can also occur by water flow, and there is a small rate of spread through the soil and through plant tissues.

Once established the *Phytophthora* is difficult and expensive to kill/eradicate. Usual action is to control and limit the spread of the disease by hygiene procedures (such as limiting vehicle access and washing down vehicles) which limit or stop soil movement.

On field trips, research staff travel from Woodvale to many areas of the State where *Phytophthora* occur. Therefore there is a risk of introducing *Phytophthora* to the reserve by soil borne spores carried on CALM vehicles returning from field trips. Similarly there is a risk of spreading the diseases from Woodvale to other reserves, again on CALM vehicles.

Canker fungi are associated with crown decline and dieback of branches. *Botryosphaeria ribis* and a *Cytospora* sp. have been isolated from *Banksia attenuata* within the reserve. Dieback of *Eucalyptus gomphocephala* is associated with infection by *B. ribis* and *Endothia* sp. Canker fungi are air borne.

Armillaria has not been reported from the reserve. However impact of *Armillaria* in tuart woodland is high, due to the presence of many susceptible plant species. The pathogen spreads by air-borne basidiospores and in infected roots.

4.2 Management Objectives

1. To prevent the introduction of *Phytophthora* species into the reserve.
2. To minimise the spread of *Phytophthora* species within the reserve.
3. To control infestations within the reserve.
4. To prevent plant stress that may predispose plants to plant diseases.

4.3 Policies and Strategies for Plant Diseases Protection

Plant disease status of the reserve to be determined and continued monitoring carried out.

Isolate any site infected with *Phytophthora* and treat if possible. Sites suspected of being infected with *Phytophthora* should be isolated until their status is known.

Construction of tracks, buildings and any other works to be carried out under strict hygiene procedures.

Vehicle movement within the reserve to be based on hygienic procedures.

Hygienic procedures will be implemented to prevent introduction of *Phytophthora* species into the reserve by research vehicles returning from field trips.

Upgrade the existing washdown unit to ensure easier use and compliance with washdown requirements.

4.4 Actions Required for Plant Diseases Protection

Determine the plant disease status of the reserve and continue monitoring of plant health.

Isolate any sites known or suspected to be infected by *Phytophthora* species.

Investigate treatment of infected sites to kill the pathogen.

New roads and firebreaks will only be created if absolutely necessary. Construction of tracks, buildings and other works to be carried out under strict hygienic procedures.

Vehicles to be confined to sealed roads with use of unsealed tracks limited to management purposes based on strict hygienic procedures.

The main access road to be curbed and drainage water directed to strategically located sumps.

The frequently used area at the rear of the vehicle compound to be lined with limestone and drained to strategically located sumps.

Additional requirements should be placed on staff to limit the introduction of soil into the reserve. These will include cleaning of vehicles before entering the reserve. Supply a list of additional washdown facilities supplied to each vehicle operating out of Woodvale.

All staff to be trained in the biology of plant diseases and hygienic procedures.

No garden material to be introduced into the reserve. All plants to be grown from seed using soil media from uninfected areas within the reserve.

Install new wash down facilities at front entrance gate including anti splash side walls and adequate water treatment storage sumps.

4.5 Research

Improve an understanding of the occurrence and biology of plant diseases in the reserve

Test methods of control.

5.0 WEEDS

Authors: Keighery G., Alford J., Langley M., Brown A.

5.1 Introduction

Thirty-two of the 186 plant species recorded on Woodvale Nature Reserve are naturalised, "weedy" species. The number of weeds found in each of the management areas designated for control of fire and weeds (Fig. 5), varies from two in area 15 to 20 in area 14. The number of species found in each area is not indicative of the level of degradation of the understory.

The control of weeds is essential if we are to retain native species diversity and the aesthetic quality of Woodvale Nature Reserve. Management strategies when implemented, should yield information applicable to other CALM lands with similar vegetation associations and levels of weed infestation.

The control measures taken will be dependent on the cost and acceptance of the use of chemicals when they represent the best method for control. Blanket control measures on the more obvious, heavily infested areas may not be as important as firstly treating the least infested areas. This approach is one used by the APB in W.A. and is advocated in the "Bradley method" of bush regeneration.

5.2 Management Objectives

1. To contain the spread of weeds within Woodvale Nature Reserve and eradicate weeds in those management areas in which infestations are minor.
2. In the long-term, eradicate major weeds such as Cape Tulip (*Homeria flaccida*) from the reserve.
3. Eradicate infestations of the weedy shrubs *Solanum sodamaeum*, *S. nigrum* and *Phytolacca octandra*.
4. To create minimal soil disturbance, unless utilising cultivation methods of weed control in order to reduce the likelihood of establishment of other weed species.
5. To formulate strategies for environmental weed control on other CALM lands.

5.3 Policies and Strategies

1. Treat areas in order of least, to most weed infested. (Based on the estimated weed cover not the number of species.)
2. Reduce grazing pressure in treated areas ie remove kangaroos from Nature Reserve.
3. To cultivate and/or spray heavily infested areas annually, over a period of several years.
4. Cease fuel reduction burning and increase rabbit control until regeneration of understory can be established (as discussed at WRC meeting 21-12-1988). The ability of the understory to regenerate seems to be intrinsically linked with fire regime and grazing pressure.
5. Fuel reduction burning to be carried out at the appropriate season - autumn and winter and not in early spring or summer.

5.4 Action for Control

1. The declared plant *Homeria flaccida* (Cape Tulip) is the most invasive weed on Woodvale Nature Reserve. The plant reproduces by seed and division of the bulbs or corms into cormils which may remain dormant for some time.

The final decision as to which management areas will be treated should be made after assessment of germination of *Homeria* in July 1991 and will be dependent on budget allocations. The most recently burnt management areas should have the heaviest germination of *Homeria* since cormil dormancy is often broken by fire. Subsequent chemical treatment of these areas is more cost effective. Heavily infested areas such as along the driveway into the Research Centre and management areas 3 and 7 may be treated by rotary hoe cultivation followed up with spraying (APB recommendations). Spray application of 2-4D Ester at 800g/litre or 2-4D amine at 500g/litre should be carried out between August and September when the Cape Tulip first develop buds. APB contractors or CALM staff can undertake this operation using back pack sprayers.

2. In lightly infested areas, especially management areas 5 and 6, Glean (Chlorosulphuron) should be applied at a rate of 20 grams per hectare using a wick applicator to "spot" treat the weeds and reduce the damage to native plants. Wick application should minimise the residual herbicide effect that Glean may have on native species (especially orchids).

3. *Solanum sodomaeum*, *Solanum nigrum* and *Phytolacca octandra* should be grubbed out, burnt and the stumps painted with 2-4D (primarily in management areas 7, 6 and 3). *Euphorbia terracina*, to date only found in management area 3, has some potential to invade the rest of the reserve. *Euphorbia terracina* in area 3 should also be treated. Control treatments of this weed on the bare land parallel to and outside of this area would minimise reinfestation.
4. Many of the other weeds are more scattered and difficult to control. *Conyza* species should be removed manually and disposed of or burnt to reduce seed dispersal, especially in management areas 7 and 12. Eradication of weeds such as *Homeria* may facilitate colonization by *Ehrharta longifolia* and for this reason species composition should be monitored carefully.
5. Removal of kangaroos and a reduction in the number of rabbits may result in colonisation of other weeds such as *Ehrharta longiflora* and *Eragrostis curvula*. Annual assessment of monitoring sites should indicate such changes.
6. Regeneration may be accelerated by planting seedlings and seed broadcasting. Material from local clearing operations could be distributed over heavily degraded areas (7 and 3), providing a natural seed source, physical protection and reduced light intensity, enabling native plants to outcompete weedy species.

5.5 Research

1. Establish monitoring quadrats (10 m²), with nested quadrats of 2 m² within, in all management areas on the least and the most weed infested sites. The topography and soil types of treatment and control quadrats should be similar.
2. Record the information of:
 - a) Estimated ratio of cover of weeds to natives
 - b) Diversity and number of natives and weeds
 - c) Proximity to healthy vegetation
 - d) Litter cover
 - e) Landform (topography) and soil type
3. Within the 2 m² quadrats, the actual number of *Homeria* plants should be recorded for future statistical analysis of the effects of treatments.

4. Determine strategies which may be used to treat similar weed infestations on other CALM estate.

BACKGROUND INFORMATION

Aira caryophyllea L

Annual, to 0.4 m, seed, Perth metropolitan area.

Origin: Europe, Africa and Asia

Anagallis arvensis L. Pimpernel

Annual herb, 0.075 to 0.45 m, seed, disturbed areas.

Arctotheca calendula (L.) Levyns.

Annual herb, 0.3 m, seed, weed of roadsides, waste places and cultivated land.

Origin: Sth. Africa.

Briza maxima L. Blowfly Grass

Annual, 0.3-0.6 m, seed, sandy soils esp. in populated areas.

Origin: Mediterranean.

Briza minor L. Shivery Grass

Annual, 0.15-0.5 m, seed, sandy soils.

Origin: Mediterranean and South USSR.

Carpobrotus edulis (L.) L. Bolus Pigface

Perennial, prostrate, sand dunes and winter-wet depressions.

Origin: Sth. Africa

Cerastium glomeratum Thuill.

Annual herb, to 45 cm, seed, gardens and disturbed places.

Origin: Europe

Conyza bonariensis (L.) Cronq.

Annual herb, to 1.2 m, seed, roadsides and cultivated areas.

Origin: Sth. America

Conyza albida

Annual to 2 m seed.

Native of Sth. America.

Conyza parva

Annual to 0.5 m seed.

Native of Sth. America

Ehrharta longiflora Smith Annual Veldtgrass

Annual, 0.3-0.6 m, seed, widespread.

Origin: S.Africa

Euphorbia peplus L.

Annual, 0.4 m, seeds, disturbed areas.

Origin: Europe and Asia.

Euphorbia terracina L.

Perennial, to 0.7 m, seeds, disturbed- usually coastal areas.

Origin: Mediterranean.

Gladiolus caryophyllaceus (N.L. Burm.f.) Poiret

Perennial, 0.4-0.8 m, corms and capsules, common in disturbed areas and some frequently burnt bushland. Origin: S. Africa (where it is rare).

Heliophila pusilla L.f.

Annual herb, to 0.5 m, seed, mainly in limestone areas along coast.

Homeria flaccida Sweet Cape Tulip

Perennial, 0.3-0.7 m, corms and capsules, widespread.

Origin: S. Africa

Hypochaeris glabra L. Flatweed

Annual or perennial herb, to 1 m, seed, weed of gardens, lawns and cultivated land.

Origin: Europe.

Lachenalia reflexa Thumb

Perennial, 0.45-1 m, seed, damp soils on Swan Coastal Plain.

Origin: Sth. Africa

Phytolacca octandra L. Inkweed

Perennial, to 2 m, fruit-seed, disturbed sites on West side of Coastal Plain.

Origin: tropical America

Romulea rosea (L.) Ecklon Guildford Grass

Annual, 0.1-0.4 m, corms and capsules, very common near Perth.

Origin: native to West and South Africa.

Sagina apetala Ard.

Annual herb, to 10 cm, seed.

Origin: Europe

Silene gallica L.

Annual herb, to 0.5 m, seed, disturbed areas.

Origin: Europe

Solanum nigrum L. Blackberry nightshade

Herb or short lived perennial shrub, seeds, widespread weed of settled areas.

Origin: Cosmopolitan

Solanum sodomaeum L. Apple of Sodom

Perennial shrubs to 1.5 m, seeds, pastures and roadsides on coastal limestone soils.

Origin: S. Africa and Mediterranean.

Sonchus oleraceus L. Sow thistle

Annual, to 1.5 m, seed, waste places and disturbed ground.

Stellaria media (L.) Villars

Annual herb, seed, gardens and disturbed areas.

Origin: Europe

Trifolium arvense L

Annual herb, to 0.5 m, seed, urban and agricultural areas.

Origin: Europe and Asia

Trifolium campestre Schreber

Annual herb, 0.3 m, seed, settled areas.

Origin: Europe.

Trifolium glomeratum L.

Annual herb, 0.3 m, seed, settled areas.

Origin: Europe

Trifolium hirtum All

Annual herb, seed, settled areas.

Origin: Mediterranean.

Ursinia anthemoides (L.) Poiret.

Annual herb, to 0.5 m, seeds, roadsides and waste places.

Origin: Sth. Africa

Vicia sativa L.

Annual herb, seeds, disturbed and cultivated areas often in winter-wet depressions.

Origin: Europe

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WEEDS INSPECTION: WOODVALE NATURE RESERVE 9th May 1991

Management area 1:

Allocasuarina, *Banksia* woodland. Very open understory with thick *Allocasuarina* needle litter, regularly burnt. Weeds: *Conyza*, *Senecio*, *Sonchus*, *Asphodelus fistulosus*

Management area 2:

Banksia woodland on yellow sand, bare soil, frequent fires. *Acacia saligna*, grove near gate of mature plants 10 m by 2 m wide. Weeds: *Homeria* infestation very heavy.

Management area 3:

Banksia and *Allocasuarina* woodland. Majority bare soil, no leaf litter. Weeds: Heavy infestation of *Homeria* to 30 cm tall (ca. 50% cover). Few *Conyza* spp.

Management area 4:

Banksia and *Allocasuarina* woodland. Reasonable understory in areas other than those close to Ranger's residence. Weeds: In degraded patches, *Homeria* is the main weed.

Management area 5:

Eucalyptus gomphocephala, *E. marginata*, *Allocasuarina* and *Banksia attenuata* woodland. Weeds: Most of eastern side in reasonably good condition. Western side from main road in to reserve, heavy *Homeria* infestation.

Management area 6:

Eucalyptus, *Allocasuarina*, *Banksia attenuata* and *B. menziesii* woodland. Weeds: Relatively healthy understory except on eastern edge. *Briza maxima* noteworthy.

Management area 7:

Banksia attenuata, *B. grandis* and *B. menziesii* woodland with *Eucalyptus gomphocephala*, *E. marginata* and *Allocasuarina*. Sparse, very degraded understory of primarily *Xanthorrhoea* and *Macrozamia*. Weeds: *Conyza* and *Phytolacca* abundant in clumps of disturbed soil. *Conyza* dense amongst *Acacia saligna* grove at northern end of area. *Homeria flaccida* and *Romulea rosea* emerging, not as advanced as in other areas.

Management area 8:

Eucalyptus and *Banksia* woodland. Understory reasonable. Very heavily degraded near compound and roads. Weeds: *Homeria* emerging, *Verbascum virgatum* flowering.

Management area 9:

Eucalyptus and *Banksia* woodland.

yellow sand, very little leaf litter. Understory highly degraded. It appears that species such as *Hibbertia hypericoides* have not, as yet recovered from the most recent fires.

Management area 10:

Eucalyptus and *Banksia* woodland. Not checked.

Management area 11:

Eucalyptus and *Banksia* woodland. Weeds: On eastern edge fairly heavy weed infestation. Grasses and sedges common (sign of dieback infestation). Western edge much healthier.

Management area 12:

Eucalyptus and *Banksia* woodland. Very degraded understory. Weeds: *Solanum nigrum* abundant, flowering and fruiting. *Homeria* emerging, requires follow-up assessment of abundance.

Management area 13:

Eucalyptus and *Banksia* woodland. Weeds: *Solanum nigrum* flowering and fruiting, reasonably abundant. *Romulea rosea* and *Homeria* emerging. Understory patchy.

Management area 14:

Eucalyptus and *Banksia* woodland. Weeds: On the south-western side, moderate infestation and on the northern side much heavier infestation of *Avena*, *Homeria* and *Romulea*.

Management area 15:

Eucalyptus marginata, *E. gomphocephala* (one only), *Allocasuarina*, *Banksia attenuata* and *B. grandis* woodland. Leaf litter of *Allocasuarina* needles to 4 cm deep on brown sand. Weeds: *Romulea*, *Homeria* are the major weeds. *Solanum nigrum* common and resprouting from old plants. Dead stalks of *Conzuya* and *Briza* common.

General observations:

The north and north-east side of the reserve appears to be more vulnerable to weed reinfestation (from the vacant land) than the boundaries adjoining the freeway and housing estate.

With limited resources it may be best to concentrate on protecting areas 5, 6 and 11 by treating all weeds within them. The treatment of weeds, especially *Homeria* should be undertaken in management areas 3, 7, 12 and 9 with rehabilitation to follow up.

6.0 EXOTIC/FERAL ANIMALS

Authors: Algar D., Leftwich T., Onus M., Churches M., Rowlands G.

6.1 Introduction

The Department of Conservation and Land Management (CALM) has responsibilities for the control of exotic/feral animals on land it manages in accordance with several CALM and other State Department Acts. These Acts are discussed in detail in Section 6.3.

Exotic animal control on Woodvale Nature Reserve can be divided into two areas :-

1. control of introduced predators (foxes and cats)
2. control of introduced herbivores (rabbit)

Predation by foxes and cats poses a serious threat to the survival of resident native species remaining on the reserve and also the breeding colonies of rare and endangered species. The rabbit is the other feral animal on the reserve where control measures are warranted. Grazing/browsing pressure by the rabbit could lead to a loss of native plant species and also land degradation if control procedures are not implemented. Other exotic animal species could gain access to the reserve and will be controlled as the need arises.

This report defines management strategies for control programmes on the reserve and provides operational guidelines for their implementation.

6.2 Management Objectives

Woodvale Nature Reserve is unique in comparison to other metropolitan nature reserves. The reserve is surrounded by a cyclone mesh security fence which restricts unauthorized public access. The fence also reduces movement of foxes and cats into the reserve however, its present construction does not prevent their immigration. Foxes and cats are currently present on the reserve and with the degree of land clearing for residential housing and freeway construction adjacent to the reserve, their numbers are likely to increase periodically. A rabbit-proof netting skirt prevents immigration of rabbits onto the reserve and thus control procedures need only consider the resident population.

With the above factors in mind exotic animal control management objectives for the reserve can be considered as follows:-

1. to implement effective and economic control procedures for the removal of foxes and cats existing on and entering the reserve.
2. to improve the present fence design to prevent further immigration of foxes and cats into the reserve, as funds are made available.
3. to eradicate the rabbit population existing on the reserve.

6.3 Policies and Strategies

Policies

The Department has responsibilities for control of exotic/feral animals on land it manages in accordance with management plan requirements (Section 56 CALM Act) or, in cases where there is no management plan, as a necessary operation under Section 33(b) (i) of the CALM Act. The Department has responsibilities for the control of declared animals on CALM lands under Section 39-41 of the Agricultural and Related Resources Protection Act (ARRP). The Act states "a Government Department shall control declared plants and animals on or in relation to public land under its control". CALM reserves the right to decide priorities and the level of control in accordance with the availability of funds. For the purpose of this policy, exotic feral animals include species introduced from outside Australia which may be declared animals (eg, foxes and rabbits) or may not be declared (eg, cats).

The Department is currently preparing a policy for exotic/feral animal control on CALM lands. As an interim measure, a set of operational guidelines has been prepared, to assist operations staff. These guidelines are designed for control programmes conducted outside the metropolitan area, rather than the unique situation at the Woodvale Research Centre. For those persons interested, the guidelines may be obtained from Protection Branch.

The most effective and economic method of controlling the species listed is to conduct either 1080 (sodium monofluoroacetate) or cyanide poisoning programmes. Use of these poisons is governed by the Health Act 'Pesticides Regulations' which must be strictly adhered to. Use of 1080 comes under Division 2 of the Health Pesticides Act, Regulations 29-31 and also the Agriculture and Related Resources Protection Act, copies of which are attached. 1080 baiting programmes proposed near or in urban areas must also be reviewed by Dr A.G. Oliver, Principal Research Officer, Agriculture Protection Board (APB). Cyanide is not a registered poison and can only be used on obtaining a written temporary permit from the Department of Health (contact M. Cousins, Environmental Health, Manager of Regulatory Affairs).

Strategies

A. Control of foxes and cats

Control of feral predators on the Woodvale Reserve to date has been conducted on an irregular and as required basis. It is proposed that monitoring of exotic animal track activity should be conducted routinely as part of the ranger's works programme. This could easily be achieved during the course of the ranger's day to day activities. It is crucial to effective predator control that movement of foxes and cats onto the reserve be detected as soon as possible.

When fox or cat activity is observed within the reserve a baiting programme should be implemented as soon as possible. The most suitable method for fox and cat control is 1080 poisoning programmes. The recommended baits are 120g meat baits dried to 40% of their original weight and dosed with 4.5 mg of 1080. The baits are manufactured by the APB. During periods when wet weather is likely, egg baits containing a 1080 impregnated oat should be used. Baits are to be laid at 200 m intervals along the boundary firebreak. Permanently pegged sites should mark the location of each bait. These sites need to be examined daily for activity and removal of baits. The baits are coated with tuna oil and must be buried just below the surface. When track activity is no longer observed all remaining baits are to be retrieved and burnt.

If 1080 use has not succeeded as a control measure, it will then be necessary to conduct a cyanide poisoning programme. Cyanide baiting procedures must be undertaken with assistance of members of the Fox Research Group. This stipulation is necessary because of the materials required and also due to safety regulations concerning the use of cyanide.

The present design of the boundary fence does not prevent access by foxes and cats into the reserve. If the fence is to be an effective barrier to movement, modifications are required. These are listed below.

1. Rabbit netting should be attached to the top of the fence over the pipe bend. This will prevent animals climbing directly over the fence.
2. The single electrified barb wire is insufficient to restrict access. The electrified barb wire should be replaced with four electrified plain wires. These 'hot wires' should be located at strategic points along the upper segment of the fence.
3. The boundary gate designs and electrification need to be modified as they are easily climbed.

B. Control of rabbits

Restriction of rabbit immigration onto the reserve has simplified control procedures. Shooting and poisoning warrens over the past several years has significantly reduced the rabbit population and now rabbit activity, across the reserve, is very low. It is important however, if the rabbit is to be eradicated from the reserve to control the remaining animals. 1080 poisoned oat trails (One Shot) should be conducted in the areas where rabbits are still present as soon as possible. Monitoring of rabbit track activity should be conducted following the poisoning operation to determine whether further baiting programmes are required.

6.4 Action Required

Action requirements are listed below in order of priority.

1. Obtain the necessary permission from the APB to conduct 1080 poisoning programmes within the reserve.
2. Ensure that all regulations concerning the use of poisons are met prior to their use.
3. Implement 1080 poison oat trails for rabbit control as soon as possible.
4. Permanently peg suitable sites for locating 1080 meat/egg baits for fox and cat control. These sites should be located every 200m along the existing boundary firebreak.
5. Obtain meat baits and 1080 poison oats for egg baits. These are to be stored at Woodvale.
6. Provide a costing of fencing requirements to the Research Centre Manager for consideration.
7. Make the necessary modification to the fence design as funds become available.

FACILITIES AND ACCESS MANAGEMENT

7.1 Introduction

Author: Friend A., Prince R.

The primary purpose of the Western Australian Wildlife Research Centre, situated on Woodvale Nature Reserve, is to facilitate conservation research on the flora and fauna of the State. There is a high degree of public interest in wildlife research and this draws attention to the Centre and hence to the Reserve.

Due to this strong public interest, there is a danger that agreement to all requests from the public for access to the Reserve will severely hamper the execution of the primary purpose of the Centre. However, the positive benefits of community education and involvement in wildlife conservation are acknowledged.

The research activities carried out at the Centre warrant the presence of equipment of high value, and there is information stored on the premises in the form of notebooks and specimens that represent a large investment of time and money. Some research projects require animals to be held in enclosures on the Reserve, either for study or as part of captive breeding projects. These animals are often of high potential monetary value on illegal local or international markets. The security of the assets present on the Reserve is therefore a primary concern of this section.

Some of the resources of the Centre are of use to other organisations and individuals involved in conservation research projects, and from time to time it is necessary that non-staff personnel have access to the Centre.

Although most of the activities at the Centre are carried out during working hours, there is a requirement for staff access to the Reserve after hours. This may be to enable officers to return from field trips outside office hours, to work at the Centre in their own time, or to observe or care for animals being held there.

7.2 Management Objectives

The issue of access management concerns maintaining reasonable access to the Reserve and the facilities thereon to Woodvale staff and *bona fide* workers from other sections of the community while preserving the security and integrity of the Reserve and its assets and other values.

The objectives of access management are:

- 1) To promote the primary purpose of the Centre, that is, to facilitate conservation research on the flora and fauna of the State.
- 2) To provide reasonable access to Woodvale staff and *bona fide* workers from other parts of the community to further the aims of conservation research.

7.3 Policies and Strategies

Primary security is to be provided by the perimeter fence, by the nightly locking of the buildings and by the presence of the Ranger, or when s/he is absent outside office hours, by other patrolling arrangements.

Personnel other than Woodvale staff may be authorised to use facilities at the Centre only if there is a nominated Woodvale officer responsible for them. Normally, access will only be granted to outside personnel during working hours. It is the responsibility of the nominated officer to ensure that the visiting personnel are aware of all rules and regulations concerning the Woodvale facilities, and that these are observed.

Tours of the Centre by groups may be authorised by the Research Centre Manager. Such tours will be authorised only if the RCM is convinced that the impact on the normal functioning of the Centre will be minimal.

Access to animal holding facilities by Woodvale staff or outside personnel may be authorised only by the officer in charge of the project for which the animals are being held.

7.4 Actions Required

Regular revision of "WAWRC Rules" including safety regulations for the information of Woodvale staff and outside personnel working at Woodvale.

8.0 REHABILITATION

Authors: Langley M., Keighery G., Mitchell D.

8.1 Introduction

There are two facets of vegetation rehabilitation required for Woodvale Nature Reserve.

Firstly, rehabilitation of works areas, in particular the site in area 14 cleared for a sewerage pipeline installation 1973, and re-excavated in 1986. To some extent, regeneration has occurred naturally in this area. There has also been plantings of seedlings of local species (1984 and 1990) and exclusion fencing erected to protect young vegetation from grazing by rabbits and kangaroos (1990). Despite the survival of many of the plants, vegetation cover remains low. Consequently, slash produced from fuel reduction programs elsewhere on the reserve has been used to reduce soil erosion.

The second area of concern is for the reserve as a whole, subsequent to the removal of grazing pressure from kangaroos and rabbits and in light of prescribed burning for fire protection management. Consideration needs to be given to the regeneration of species affected by grazing and by fire, such as *Banksia prionotes* - a non sprouting seeder which is usually killed by fire and which would therefore have been susceptible to reduced seedling recruitment with regular burning and susceptible to further decimation by grazing of seedlings.

To achieve optimum regeneration the following factors need to be considered:

1. The natural floral composition and cover of the different vegetation types existing on the reserve.
2. The regeneration strategies of species which may need active promotion of re-establishment (e.g. reseeding, planting, fire).
3. A measure of the effectiveness of various techniques for promoting species reestablishment (e.g. seeding, planting, transplanting,) under various conditions such as past/present grazing, prescribed burning or close proximity to sources of invasive plant species.

8.2 Management objectives

1. To regenerate works-disturbed areas, in stages, to a state where vegetation cover and species composition are similar to the surrounding vegetation.
2. To achieve optimum regeneration of Reserve vegetation following removal of vertebrate grazing pressure and following prescribed burning.

8.3 Policies and Strategies

1. Monitor vegetation to ascertain health of vegetation and progress of regeneration, particularly in the more susceptible areas such as those works-disturbed, burnt/slashed under fire protection programs or near sources of potentially invasive species.
2. Assess effectiveness of previous and potential programs of rehabilitation including allowing natural regeneration.
3. Determine regeneration strategies of species in order to promote re-establishment where necessary, where possible.
4. Use replanting and other methods of promoting regeneration in areas where natural regeneration is not achieving a desirable level of vegetation cover and species diversity.

8.4 Action Required

1. Establish monitoring quadrats (10m²) in all management areas including works-disturbed, prescription burnt/slashed, near sources of invasive species and controls of healthy vegetation.

These quadrats may be set up in conjunction with weed monitoring and fire effect monitoring.

Information to be recorded should include species presence, species cover estimate and species regeneration strategy.

2. Continue monitoring currently established program of replanting to assess effectiveness.
3. Implement re-establishment programs as required and include seed collection, germination and replanting as well as other techniques which may be determined by results of action 1.

9. LIBRARY

Author: Clift H.

9.1 Introduction

The first Library Strategic Plan (1988-1991) recommended that "as a long-term goal, CALM's Library HQ should be established at SOHQ, whereas the Woodvale Library should become, eventually, the Research Division Library". CALM's Policy Directorate "agreed that in the long-term the headquarters of the CALM Library can be transferred to the Operational HQ", but added: "This depends on a major building programme" (Minutes of Meeting No 106, 11.7.88).

Of course, in the present economic climate a major building programme is out of the question, but in September 1990 the Como Branch Library was finally established on a full-time basis with its relocation to the Old Museum (Research Branch) and a second Library Strategic Plan (1991-95) has been prepared which envisages the "take-over" of the Research Branch Auditorium at Como and the restructuring of the Old Museum into a two-storied facility, with the second storey continuing over the staff tea-room.

Obviously, the planned structural alterations will be costly, but nothing like the cost of a major building programme, and in addition, the Library Strategic Plan envisages the relinquishing of the lower half of the Library as 160m² of additional office space; an area which would require far less cost to adapt for office space than the construction of another building at Woodvale.

These space/cost "trade-offs" should make the relocation of the Main Library at Como feasible, and merit serious consideration by the WRC management, as the distinct possibility of a takeover of 160m² must impact on the WRC's Management Plan.

9.2 Management Objectives

Relative to the WRC Management, the Library's objectives may be stated as:

- 1 To continue to provide Library facilities at Woodvale on a full-time basis - by
- 2 Maintaining the Woodvale Library as a major Branch Library of the CALM Library system.

- 3 To have the Woodvale Library recognised as a specialist Library for CALM's library materials on:
conservation
the environment
ecology; and
zoology
- 4 To maintain a substantial collection of botanical books and journals (quite apart from the Herbarium Library).

Note: In effect, these objectives amount to the retention at Woodvale of all the "500s" classified books and all the non-forestry journals, along with 3 FTE staff.

9.3 Policies and Strategies

9.3.1 Policies

- 1 The concept of a single metropolitan CALM Library is rejected, on the principle that library resources should be held where they will be most effectively used by the greatest number of CALM staff.
- 2 On this basis, the forestry books and journals at the Woodvale Research Centre should be relocated at the Como Library, while the wildlife/conservation resources should be retained at Woodvale. The Herbarium Library should be retained as a discrete entity.
- 3 The Como and Woodvale Libraries should be staffed full-time and the Herbarium should be staffed at least 2/3 FTE (3 1/2 days a week).
- 4 The Woodvale, Herbarium and satellite libraries should not be available to the public, except in special circumstances. However, the Como Library should be recognised as a "back-up" resource to the Front Counter and the public should be permitted to use the Como Library as a reference library (i.e. without borrowing rights).

9.3.2 Strategies

- 1 The Woodvale Library is to remain the systems HQ for Library database management, acquisitions and interlibrary loans.
- 2 The Woodvale Library will be staffed by a qualified professional Librarian, a Library Technician and a Library Assistant (i.e. Woodvale Library staff will be reduced from 4 to 3).
- 3 It is a major strategy of this Plan that the information technology development should precede the development of library resources, even though book and journal collections are very inadequate to meet the Department's information needs.

ACTION REQUIRED 1991/91 - 1994/95

Financial Year

- | | |
|---------|---|
| 1991/92 | Establish the Information Technology basis for adequate library services. |
| 1991/92 | Relinquish the lower half of the Woodvale Library. |
| 1992/93 | Establish the recurring resources funding for adequate library services. |
| 1993/94 | Restructure and equip the Como Library as the Main Library. |

From Woodvale's viewpoint, the most far-reaching recommendation of the Library Strategic Plan is the relinquishing of the lower half of the Library. Obviously, this is contingent upon the Como Branch Library's takeover of the Research Branch's Auditorium at Como.

REPTILES, AMPHIBIANS AND MAMMALS OF WOODVALE NATURE RESERVE

Source: Friend G. & Mitchell D. November 1985 - March 1986

LIZARDS

Cryptoblepharus plagioccephalus
Ctenotus fallens
Diplodactylus sp. cf. *vittatus*
Morethia obscura
Menetia greyi
Lerista elegans
Lerista praepedita
Hemiergis peroni quadrilimeata
Aprasia repens
Lialis burtonis
Pogona minor
Phyllodactylus marmoratus
Varanus gouldii
Varanus tristis

SNAKES

Ramphotyphlops australis
Vermicella semifasciata
Pseudonaja affinis
Morelia spilota

FROGS

Limnodynastes dorsalis
Heleioporus eyrei
Myobatrachus gouldii
Litoria moorii

MAMMALS (NATIVE)

Macropus fuliginosus - Grey Kangaroo
Macropus irma - Western Brush Wallaby
Bats - No data

MAMMALS (INTRODUCED)

Mus musculus - House Mouse
Rattus rattus - Black Rat
Ongctolagus cuniculus - Rabbit
Vulpes vulpes - Fox (occasional)
Felis catus - Cat (occasional)

APPENDIX II

BIRDS OF WOODVALE NATURE RESERVE

Source: Compiled by Allan Burbidge from records gathered by Phil Fuller, Andy Williams, Judith Harvey and Allan Burbidge - May 1991.

White-faced Heron	vagrant (overhead); last record Feb. 1988
Great Egret	vagrant (overhead); one record Feb. 1986
Australian Shelduck	vagrant; last record June, 1991 DSM
Black-shouldered Kite	vagrant; no recent records
Whistling Kite	vagrant; no recent records
Brown Goshawk	summer autumn visitor
Collared Sparrowhawk	vagrant; no recent records
Wedge-tailed Eagle	vagrant; no recent records
Little Eagle	mostly winter-spring
Australian Hobby	vagrant; last record Oct. 1985
Brown Falcon	vagrant; no recent records
Australian Kestrel	vagrant; no recent records
Banded Lapwing	vagrant; no recent records
Laughing Turtle-Dove	uncommon, breeding
Common Bronzewing	vagrant; no recent records
Carnaby's Black-Cockatoo	irregular visitor
Galah	uncommon
Little Corella	vagrant; no recent records
Sulphur-crested Cockatoo	vagrant (escapees)
Rainbow Lorikeet	first recorded autumn 1991
Purple-crowned Lorikeet	vagrant; last recorded March & April 1986
Red-Capped Parrot	uncommon (least in summer); breeding
Port Lincoln Ringneck	common breeding resident (nesting in hollows in tuarts)
Elegant Parrot	autumn-winter, sometimes spring
Pallid Cuckoo	uncommon, winter-spring

Fan-tailed Cuckoo	rare autumn-winter visitor
Horsfield's Bronze-Cuckoo	vagrant; no recent records
Shining Bronze-Cuckoo	common July-December; breeding
Southern Boobook	? resident
Barn Owl	? resident; breeding (nest in hollow in tuart west of numbat enclosure)
Tawny Frogmouth	? resident
Laughing Kookaburra	uncommon resident, presumed breeding
Sacred Kingfisher	spring-summer visitor; breeding
Rainbow Bee-eater	visitor Oct-Feb, breeding
Welcome Swallow	rare visitor
Tree Martin	rare visitor
Black-faced Cuckoo-shrike	uncommon, breeding
Scarlet Robin	uncommon ?resident; breeding
Red-capped Robin	vagrant; no recent records
Golden Whistler	vagrant; a breeding plumage male seen by J. Harvey in mid-1980s
Rufous Whistler	common breeding resident
Grey Shrike-thrush	common breeding resident
Grey Fantail	common breeding
Willie Wagtail	vagrant; last recorded July 1989
Splendid Fairy-wren	formerly uncommon breeding resident; last definite record May 1991 (probably no longer resident)
Weebil	common, presumed breeding
Western Gerygone	common, presumed breeding
Inland Thornbill	uncommon ?resident, presumed breeding
Western Thornbill	common breeding resident
Yellow-rumped Thornbill	uncommon breeding resident

Varied Sittella	uncommon ?breeding ?resident
Red Wattlebird	uncommon, mostly autumn, but breeding recorded in spring
Little Wattlebird	rare summer-autumn visitor
Yellow-throated Miner	no recent records
Singing Honeyeater	uncommon
Brown-headed Honeyeater	rare visitor
White-naped Honeyeater	vagrant; last record July 1989
Brown Honeyeater	common breeding
New Holland Honeyeater	rare visitor (breeding once)
White-cheeked Honeyeater	vagrant; last record January 1991
White-fronted Honeyeater	one record
Western Spinebill	common, mostly autumn; breeding
Mistletoebird	rare visitor
Spotted Pardalote	rare visitor
Striated Pardalote	common, mostly winter-spring, resumed breeding
Silvereye	common, breeding
Australian Magpie-lark	vagrant; last record May 1988
Dusky Woodswallow	vagrant
Grey Butcherbird	rare; breeding
Pied Butcherbird	vagrant - one record, March 1986
Australian Magpie	uncommon
Australian Raven	common, apparently breeding

	STATUS ¹	SPECIMEN ²	Occurrence - Management Zone															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<i>Senecio laetus</i>						x	x											
<i>Sonchus oleraceus</i>	*																	
<i>Jrsinia anthemoides</i>	*	+	x	x	x		x				x	x			x	x		
<i>Waitzia suaveolens</i>		+													x	x	x	
															x			
AZIOACEAE																		
<i>Carpobrotus edulis</i>	*			x		x	x				x						x	
BRASSICACEAE																		
<i>Brassica tournefortii</i>	*																	
<i>Heliophila pusilla</i>	*									x					x	x		
CAMPANULACEAE																		
<i>Wahlenbergia capensis</i>	*							x	x	x								
<i>Wahlenbergia gracilentata</i>								x	x						x	x	x	
CARYOPHILLACEAE																		
<i>Cerastium glomeratum</i>	*							x	x						x	x		
<i>Petrorhagia velutina</i>	*	+									x				x	x		
<i>Sagina apetala</i>	*							x								x	x	
<i>Silene gallica</i>	*														x	x	x	
<i>Silene nocturna</i>	*	+														x		
<i>Stellaria media</i>	*							x	x								x	
CASUARINACEAE																		
<i>Allocasuarina fraseriana</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>Allocasuarina humilis</i>				x		x						x			x			
CENTROLEPIDACEAE																		
<i>Centrolepis drummondiana</i>					x	x	x											
<i>Centrolepis pilosa</i>												x			x	x	x	
CHENOPODIACEAE																		
<i>Rhagodia baccata ssp. dioica</i>				x										x	x			
CRASSULACEAE																		
<i>Crassula colorata</i>		+			x		x				x	x			x	x	x	
<i>Crassula exserta</i>										x					x			
<i>Crassula pedicellosa</i>								x	x						x	x	x	

CYPERACEAE	STATUS ¹	SPECIMEN ²	Occurrence - Management Zone															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<i>Isolepis marginata</i>								x				x			x	x	x	
<i>Lepidosperma tenue</i>		+											x	x	x			
<i>Lepidosperma angustatum</i>			x		x	x	x	x	x	x	x		x	x	x	x		
<i>Lepidosperma scabrum</i>		+																
<i>Mesomelaena pseudostygia</i>		+	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>Mesomelaena tetragona</i>		+																
<i>Schoenus clandestinus</i>																		
<i>Schoenus curvifolius</i>								x									x	
<i>Schoenus grandiflorus</i>					x			x		x				x				
DASYPOGONACEAE																		
<i>Acanthocarpus preissii</i>				x			x						x			x	x	
<i>Lomandra caespitosa</i>							x	x				x			x	x		
<i>Lomandra maritima</i>			x					x						x	x	x		
JENNSTAEDTIACEAE																		
<i>Pteridium esculentum</i>		*										x						
JILLENACEAE																		
<i>Hibbertia hypericoides</i>		+	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>Hibbertia racemosa</i>		+		x	x	x	x	x		x	x		x	x	x	x	x	
DROSERACEAE																		
<i>Drosera erythrorhiza</i>					x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>Drosera glanduligera</i>													x	x	x	x		
<i>Drosera macrantha</i>					x			x	x		x	x	x		x	x		
<i>Drosera pallida</i>		+																
EPACRIDACEAE																		
<i>Astroloma ciliatum</i>								x	x									
<i>Astroloma pallidum</i>								x										
<i>Conostephium minus</i>			x				x	x			x				x			
<i>Conostephium pendulum</i>					x		x	x										
<i>Conostephium preissii</i>		+	x				x	x				x			x	x		
<i>Leucopogon propinquus</i>			x	x	x				x		x							
EUPHORBIACEAE																		

	STATUS ¹	SPECIMEN ²	1	2	3	4	Occurrence - Management Zone										
							5	6	7	8	9	10	11	12	13	14	15
<i>Euphorbia peplus</i>	*									x	x	x					
<i>Euphorbia terracina</i>	*	+			x												
<i>Monotaxis grandiflora</i>							x										
<i>Phyllanthus calycinus</i>					x	x	x	x	x		x	x	x	x	x	x	
<i>Poranthera microphylla</i>															x		
<i>Ricinocarpus glaucus</i>							x					x					x
GOODENIACEAE																	
<i>Scaevola canescens</i>				x		x									x		
HAEMODORACEAE																	
<i>Anigozanthus humilis</i>							x			x							
<i>Conostylis aculeata</i>		+	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Conostylis candicans</i>		+	x														
<i>Haemodorum laxum</i>																	
<i>Haemodorum panniculatum</i>						x						x					
<i>Haemodorum spicatum</i>													x			x	
IRIDACEAE																	
<i>Gladiolus caryophyllaceus</i>	*										x	x					
<i>Homeria flaccida</i>	*		x		x	x			x	x	x	x			x	x	x
<i>Romulea rosea</i>	*	+					x								x	x	x
JUNCACEAE																	
<i>Luzula meridionalis</i>					x												
JUNCAGINACEAE																	
<i>Triglochin centrocarpa</i>							x										
LAMIACEAE																	
<i>Lavandula dentata</i>	*																x
LILIACEAE																	
<i>Burchardia umbellata</i>		+	x	x	x	x	x			x	x	x	x	x	x	x	
<i>Caesia micrantha</i>			x				x										
<i>Corynotheca micrantha</i>		+															
<i>Dianella revoluta</i>			x	x	x	x	x	x					x		x		
<i>Laxmannia squarrosa</i>									x				x	x	x	x	
<i>Lachenalia reflexa</i>	*		x	x		x				x	x			x			x

	STATUS ¹	SPECIMEN ²	Occurrence - Management Zone														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<i>werbaea laxiflora</i>		+	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>ysanotus arenarius</i>			x	x		x	x					x	x	x			
<i>ysanotus dicotomus</i>												x					
<i>ysanotus patersonii</i>			x	x	x		x			x	x	x	x	x	x		
<i>ysanotus sparteus</i>			x	x		x	x					x	x	x			
<i>ysanotus triandrus</i>							x										
<i>icoryne elatior</i>		+										x					
OBELIACEAE																	
<i>otoma hypocrateriformis</i>						x					x				x		
<i>belia tenuior</i>		+										x					
MOSACEAE																	
<i>acia cyclops</i>									x			x					
<i>acia lasiocarpa</i>		+	x														
<i>acia pulchella</i>		+							x								
<i>acia rostellifera</i>				x	x												
<i>acia saligna</i>			x	x	x				x		x	x	x	x	x	x	
<i>acia willdenowiana</i>					x		x					x					
ERTACEAE																	
<i>ekea camphorosmae</i>					x							x				x	
<i>emaea pauciflora</i>			x	x													
<i>calyptus calophylla</i>						x					x						
<i>calyptus gomphocephala</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>calyptus marginata</i>		+			x	x	x	x	x	x	x	x	x	x	x	x	x
<i>pocalymma robustum</i>		+	x	x	x		x	x		x		x	x	x	x	x	x
CHIDACEAE																	
<i>ladenia "arenicola"</i>						x		x									
<i>ladenia discoidea</i>		+			x												
<i>ladenia flava</i>				x	x	x	x		x	x	x	x		x	x		
<i>ladenia "georgei"</i>					x		x										
<i>ladenia latifolia</i>					x	x	x		x	x		x				x	x
<i>ladenia longicauda</i>					x		x										
<i>yanicula" deformis</i>							x	x		x	x						
<i>yanicula" gemmata</i>											x						
<i>rtostylis huegelii</i>								x									
<i>luris corymbosa</i>									x								x

	STATUS ¹	SPECIMEN ²	Occurrence - Management Zone																
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
<i>Diuris</i> aff. <i>longifolia</i>						x	x	x	x										
<i>Elythranthera brunonis</i>						x	x												
<i>Eriochilus dilatatus</i>																			
<i>Leptoceras menziesii</i>																			
<i>Lyperanthus nigricans</i>																			
<i>Microtis media</i>			x			x	x	x		x			x		x		x		
<i>Prasophyllum giganteum</i>																			
<i>Pterostylis</i> aff. <i>nana</i> (1)																			
<i>Pterostylis</i> aff. <i>nana</i> (2)																			
<i>Pterostylis sanguineus</i>						x	x	x		x	x		x					x	
<i>Thelymitra</i> aff. <i>fuscolutea</i>						x	x	x		x	x		x					x	
<i>Thelymitra fuscolutea</i>									x	x									
PAPILIONACEAE																			
<i>Daviesia divaricata</i>		+	x		x	x	x	x		x	x		x	x	x		x		
<i>Daviesia gracilis</i>		+	x		x	x	x	x				x	x						
<i>Daviesia nudiflora</i>		+	x		x	x	x	x					x	x	x		x		
<i>Daviesia pectinata</i>					x		x	x						x	x		x		
<i>Daviesia triflora</i>			x		x	x	x	x				x	x						
<i>Gompholobium knightianum</i>					x	x	x	x				x	x						
<i>Gompholobium tomentosum</i>		+				x	x			x								x	
<i>Hardenbergia comptoniana</i>		+	x	x	x	x	x	x		x			x				x	x	
<i>Hovea trisperma</i>		+			x		x	x									x	x	
<i>Isotropis cuneifolia</i>			x			x	x												
<i>Jacksonia furcellata</i>										x	x								
<i>Jacksonia sericea</i>			x	x							x								
<i>Jacksonia sternbergiana</i>				x	x	x	x												
<i>Kennedia prostrata</i>													x						
<i>Medicago polymorpha</i>	*																		
<i>Nemcia reticulatum</i>		+			x	x	x	x										x	
<i>Trifolium arvense</i>	*	+																x	
<i>Trifolium campestre</i>	*	+											x	x				x	
<i>Trifolium glomeratum</i>	*																	x	
<i>Trifolium hirtum</i>	*	+																x	
<i>Vicia sativa</i> ssp. <i>nigra</i>	*																		
PHYTOLACCACEAE																			
<i>Phytolacca octandra</i>	*	+					x												

	STATUS ¹	SPECIMEN ²	Occurrence - Management Zone														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
POACEAE																	
<i>Aira cupaniana</i>	*							x	x							x	x
<i>Avena fatua</i>	*																x
<i>Briza maxima</i>	*																x
<i>Briza minor</i>	*											x					
<i>Bromus diandrus</i>	*							x				x					
<i>Danthonia setacea</i>												x					
<i>Ehrharta longiflora</i>	*								x			x		x		x	
<i>Poa drummondiana</i>													x	x			
<i>Stipa semibarbata</i>		+															
<i>Stipa compressa</i>											x		x	x			x
<i>Vulpia bromoides</i>	*	+															
POLYGALACEAE																	
<i>Comesperma confertum</i>											x	x					
PORTULACACEAE																	
<i>Calandrinia brevipedata</i>								x	x							x	x
<i>Calandrinia corrigioloides</i>													x				
<i>Calandrinia liniflora</i>													x				
PRIMULACEAE																	
<i>Anagallis arvensis</i>	*																
PROTEACEAE																	
<i>Banksia attenuata</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Banksia grandis</i>										x	x		x		x		
<i>Banksia menziesii</i>			x	x		x		x	x	x	x	x	x	x	x	x	x
<i>Banksia prionotes</i>					x					x	x	x					x
<i>Dryandra nivea</i>					x			x									
<i>Dryandra sessilis</i>											x	x					
<i>Grevillea vestita</i>					x				x		x					x	
<i>Hakea lissocarpa</i>		+	x	x	x	x	x	x	x	x	x		x	x	x	x	x
<i>Hakea prostrata</i>					x	x		x	x				x	x	x		
<i>Persoonia saccata</i>								x									
<i>Petrophile linearis</i>		+						x	x	x	x			x			x
<i>Petrophile macrostachya</i>		+		x	x	x	x			x	x	x	x	x	x	x	x
<i>Petrophile brevifolia</i>										x							x
<i>Synaphea spinulosa</i>							x										x

STATUS ¹	SPECIMEN ²	Occurrence - Management Zone														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RANNUNCULACEAE																
	<i>Clematis microphylla</i>															
	<i>Clematis pubescens</i>											x				
										x		x				x
RESTIONACEAE																
	<i>Alexgeorgia nitens</i>															
	<i>Loxocarya cineria</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RHAMNACEAE																
	<i>Cryptandra mutila</i>															
	<i>Spyridium tridentatum</i>													x		
																x
RUBIACEAE																
	<i>Opercularia vaginata</i>															
									x							
												x				
RUTACEAE																
	<i>Eriostemon spicatus</i>															
SOLANACEAE																
	<i>Solanum nigrum</i>	*	+													
	<i>Solanum sodomium</i>	*	+									x			x	x
STYLIDIACEAE																
	<i>Levenhookia stipitata</i>		+													
	<i>Stylidium brunonianum</i>											x			x	
	<i>Stylidium calcaratum</i>		+									x				
	<i>Stylidium junceum</i>					x	x			x	x	x	x	x	x	x
	<i>Stylidium schoenoides</i>		+							x						
														x		
THYMELAEACEAE																
	<i>Pimelea sulphurea</i>		+													
																x
VIOLACEAE																
	<i>Hybanthus calycinus</i>		+													
																x
XANTHORROEACEAE																
	<i>Xanthorrhoea preissii</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

AMIACEAE

acrozamia riedlei

STATUS ¹	SPECIMEN ²	1	2	3	4	Occurrence - Management Zone										
						5	6	7	8	9	10	11	12	13	14	15
						x		x								

* = believed exotic
 G = in garden plantings

+ = mounted specimen in Woodvale Reserve Field Herbarium

FIRE EMERGENCY PROCEDURES WOODVALE NATURE RESERVE

**PROCEDURES TO BE FOLLOWED BY DUTY FIRE WARDEN
IN THE EVENT OF FIRE AT WOODVALE**

1A IF SIREN AND WAFB BELL HAVE NOT BEEN ACTIVATED

Close own windows and door of own office.

Determine nature of threat, if necessary, send staff (if 4WD use Ranger + 1) to investigate fire and report back (by radio if necessary).

If justified:

- * activate fire siren switch on front wall of workshop (this alerts staff on premises);
- * activate (break glass) WAFB bells at the front office, outside Lab 12 and/or library (this summons WA Fire Brigade). Telephone WAFB (000) to confirm fire brigade on way;
- * have CALM Wanneroo District Office notified by telephone 405 1222 all hours or radio channel 9 or 1 (request their attendance).

Collect fire keys from Clerk's office (workshop, fire cabinet, front gates, rear and side gates, compound, building master key).

Proceed to Assembly Area adjacent to workshop with all personnel.

OR

1B IF SIREN OR WAFB BELL HAS BEEN ACTIVATED

Close own windows and door or own office.

DFW to collect keys from Clerk's office.

Proceed to Assembly Area adjacent to workshop (with all personnel).

Determine nature of threat from person who activated alarm [then if necessary, send staff (if 4WD use Ranger + 1) to investigate fire and report back].

If justified:

- * activate (break glass) WAFB bell at front office, outside Lab 12 and/or at library (this summons WA Fire Brigade), and
- * have CALM Wanneroo District Office notified by telephone 405 122 all hours or by radio channel 9 or 1 (request their attendance).

2. FURTHER ESSENTIAL ACTION - DFW

- i) Take possession of fire manual, 2 x VHF hand-held radios, personnel movements log, maps, etc.) in the fire cabinet in the workshop.
- ii) Remind staff they must remain in Assembly Area until otherwise instructed, and must follow DF Warden's instructions.
- iii) Appoint "secretary" to log personnel movements in log provided.
- iv) Send 1-2 officers to turn on some or all of the 4 external sprinkler systems (see map: the 4 valves are east of library, between library and main buildings, near rear entrance to buildings, and at driveway entrance to Ranger's residence). The small roof sprinkler valve V3 outside west wall of library to be turned on last (if possible) or reduce water pressure flow on V3 until all other units are operating.
- v) Send three staff to front office to operate switchboard and 2-way radio. These staff are to:
 - * telephone WAFB (000) to confirm fire brigade on its way;
 - * maintain communications with and between Duty Fire Warden, WAFB, Wanneroo CALM staff and Woodvale Ranger's vehicle, as necessary.
- vi) Dispatch officers (in pairs if possible) to check new wing, old wing, computer room, library and Ranger's residence that they have been vacated and windows and doors closed, and report back to "secretary" at assembly area or by VHF radio.

3. FURTHER OPTIONAL ACTION - DFW

- i) Have 1-3 teams (each of 3 staff) don protective clothing (one team at a time, and refer to list of clothing sizes).
- ii) Check map (in WRC fire manual) of hydrant locations and dangerous stores. Send teams to specified fire hydrants (they are numbered, see map) to "water-down" the ground and vegetation. Tell these teams to retreat to the workshop if fierce fire approaches.
- iii) Send 1-3 staff to car parks to wind up all car windows, and report back.
- iv) Deploy Ranger + 1 in 4WD (2 sets of protective clothing in vehicle) to location of fire, or to reserve boundary to attack "hopovers". They must keep Duty Fire Warden advised of developments via VHF radio contact with front office.
- v) If fire not threatening entrance roadway, send officer (with 2 gate keys), in vehicle, to manually open front gates, chain them open, erect "fire vehicles only" sign in roadway, and report back (sign is in fire cabinet at workshop).
- vi) If fire is not threatening emergency (rear) entrance, send officer (with single gate key), in vehicle, to open rear gate and west side fence gate, and report back to DFW.

It is anticipated that the WAFB from the Wangara Station should be on site very quickly to take over "fire control" duties and to execute fire suppression procedures. Pending the arrival of the WAFB, CALM staff will undertake all reasonable steps to deal with the fire under the control of the DFW.

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December 6, 1990