INTERIM GUIDELINES FOR NECESSARY OPERATIONS

YULE BROOK RESERVE

Conservation and Land Management

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YULE BROOK RESERVE

Background: In 1948 the University acquired, on behalf of the Department of Botany, some 35 ha of land in the Kenwick district as a facility for botanical research and teaching (Fig. 1).

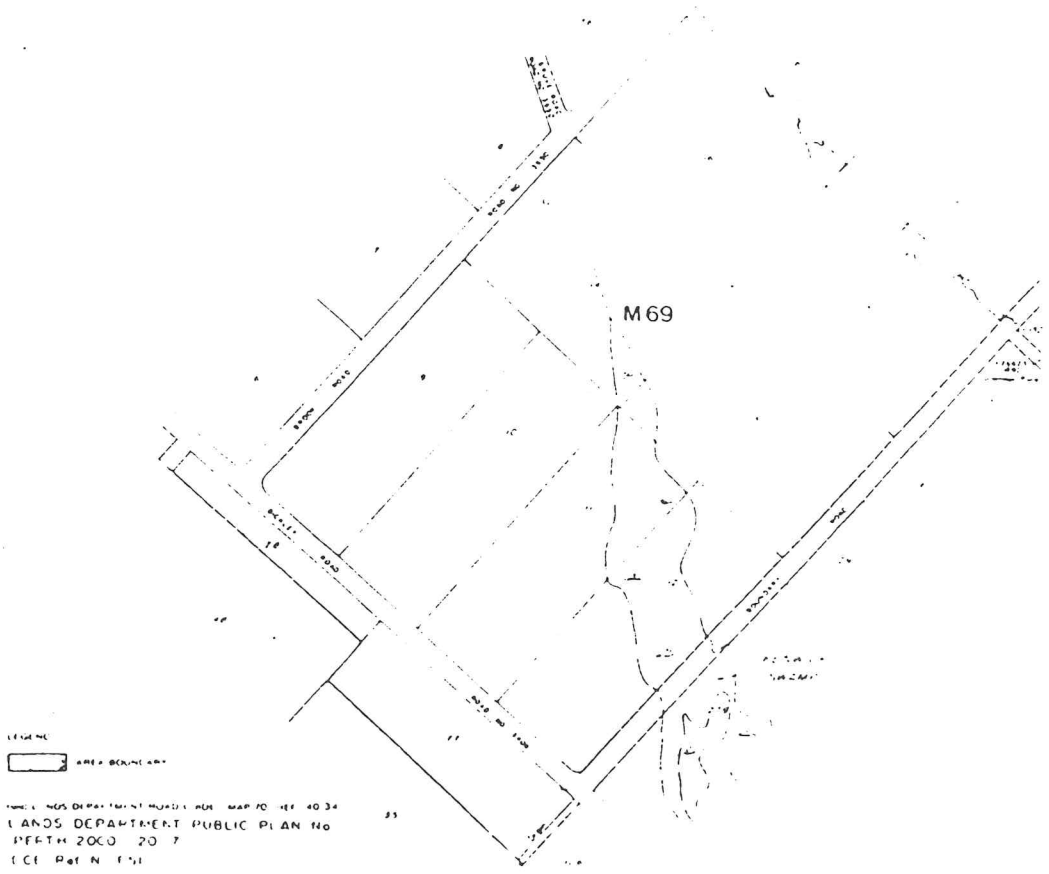

Fig. 1

Since then the area has been regularly used in undergraduate courses for field work and as a collection site for class and examination material. It has been the main study site for two completed MSc and one PhD programme, as well as a contributing site in several other higher degree programmes. In addition, the area is currently used in a number of staff research projects.

The past and continuing botanical significance of the Yule Brook Reserve is summed up in the entry given in the Department of Conservation and Environment "System 6 Study Report: The Darling System, Proposals for Parks and Reserves" (1981), which reads in part:

"Kenwick Swamp is the only surviving area of its kind and its exceptional concentrations of unusual plants makes it very attractive to botanists. The associations of plants which occur there are unique, and several species are unknown outside the area. The swamp is threatened by a falling water table.

"Private groundwater extraction may affect water levels, and there may be pollution due to drainage from local septic systems. The area may be affected by future sewerage and drainage works.

Recommendations

M69.1 The University of Western Australia, in consultation with the Department of Fisheries and Wildlife, should prepare a management programme giving consideration to:

(a) minimising the impact of surrounding development on the swamp's water level;
(b) fire control;
(c) reducing weed infestation.

M69.2 If the University of Western Australia wishes to dispose of the land in the future it should be purchased when available and declared a Class C Reserve, for the purpose of Conservation of Flora and Fauna and Water, and the Reserve should be vested in the W.A. Wildlife Authority."

During the 1970's and early 1980's a number of farmlets have been established in the vicinity of the Estate. As indicated by the above statement the effect of these developments is uncertain. They do, however, increase the likelihood of weed invasion and the need for fire control.

When inspecting the fire breaks in 1986 with the University Ranger, Mr R J Abel, Dr Loneragan expressed concern that the constant grading of the breaks was producing deep trenches and probably affecting drainage patterns within the Reserve. This observation suggested that a detailed management plan should be prepared and an informal approach for assistance was made to the Department of Conservation and Land Management (CALM).

In April 1987 the University was advised that a developer, St Joseph's Properties Pty Ltd, was intending to develop land south of Lot 77/78 of the Reserve for residential purposes. The developer wished to know the University's intentions in respect of the land and its attitude to the proposed development. This advice has precipitated the need for the Department of Botany to consider the longer-term use of the Reserve lands and to accelerate preparation of the formal management plan.

Current Position: A meeting has been held (24th June) to discuss the proposed development, its possible effects upon the Reserve and options for resolving perceived difficulties. The meeting was attended by:

Professor C A Atkins and Dr W A Loneragan (Botany)
Mr I J Peacock (Investment Services)
Mr D Haswell (CALM)
Mr K Meyer and Mr J Tomlinson (for the Developers)

The Developer is seeking a rapid decision by the University as he intends to proceed with his application around 10th July. The points noted during the meeting may be summarized as follows:

1. Botany does not see the proposed development impinging directly upon the drainage of the main part of the Reserve (Lts 9-16, Fig. 1). It will, however, impinge upon Lots 77 and 78.

2. Botany presently uses Lots 77/78 for collecting class material only and these lots are not viewed as being critical to the long-term survival of the main swamp system but important as a 'buffer'.

3. Botany would not wish to extend the current land holding (this was in response to the Developer's offer to sell some of Lot 48), but saw some advantages in relinquishing Lots 77/78, especially if any funds so generated were made available for implementing a management plan.

4. The developer indicated he was not interested in the purchase of Lots 77/78 but was prepared to consider a "ground lease arrangement of Lot 78". He was also prepared to approach his co-developer of the adjacent Lot 35 in respect of Lot 77. He further suggested consideration be given to averaging the depth of the two lots to ca 50 m and requested details of what Botany, in consultation with CALM, would consider appropriate management requirements. This arrangement could have advantages in that it should not require the University to directly manage these lots while retaining control.

5. Botany was to prepare a set of 'Interim Guidelines for Operations', following a format recommended by CALM, pending development of the final management plan. These Guidelines were to be sufficient to allow the University's Investment Services section to determine the financial implications of implementing an improved management programme. They were also to provide enough detail for the Developers to determine their likely obligations. Items with more immediate cost implications are marked thus *.

INTERIM GUIDELINES FOR OPERATIONS ON YULE BROOK RESERVE

PART 1

1. DESCRIPTION

1.1 Location and Tenure

Yule Brook Reserve lies some 20 km southeast of the centre of Perth (32° S 115'E). The Reserve comprises approximately 35 ha of land, being lots 9,10,11,12,13,14,15 and 16, bounded on three sides by Brook, Bickley and Boundary Roads. Two further lots, Lots 77 and 78, lie immediately south of Bickley Road.

Titles to the land are held by the University of Western Australia.

* It is proposed that Lots 77 and 78 be leased to Adelaide Steamships Co and St Joseph's Properties Pty Ltd, developers of adjoining Lots 35 and 48 respectively.

1.2 Topography, Soils and Climate

These are described in detail in such publications as Speck (1952), Speck and Baird (1984), and Stephens (1985). Lots 77 and 78 are not specifically described in these or other publications; they do however belong to the same system and are similar in character.

1.3 Flora and Fauna

The most recent and complete account of the flora is to be found in Speck and Baird (1984), who report that the indigenous flora comprises some 370 species in 52 families, many (e.g. Drosera spp. etc.) being of special biological interest.

No general survey of the fauna has been made to date. Collections of some invertebrate species have been made (e.g. Houston 1983).

1.4 Past History

This is summarized by Speck and Baird (1984). There are no known archeological sites of aboriginal significance.

1.5 Existing Use

The Reserve is currently used by the Department of Botany, University of Western Australia for teaching and research. The Reserve is not currently open to the general public though use by special interest groups is an option that could be considered in the future.

*Actions with financial implications for either UWA or Developers.

PART 2

2. GENERAL MANAGEMENT OBJECTIVES

To protect and manage the land system, flora and fauna so that the Reserve's inherent interest as a coastal plain dune/wetland remnant is conserved. To provide for continuation of the teaching and research use of the Reserve. To provide suitable access for implementation of management operations.

3. FIRE PROTECTION

3.1 Introduction

Aspects of fire history on the Reserve between 1948-72 and the response of the vegetation have been documented by Baird (1984). As far as is known the fires have been deliberately lit by vandals, the most recent in 1976. Perimeter firebreaks have been maintained as a local Council requirement for many years and, in 1964, during a wildfire, the local fire brigade cut two new internal breaks to control the outbreak (Fig. 2). In 1976 the Council requested the University to formalise and maintain these cuts as permanent firebreaks.

Part of the main ridge adjacent to Boundary Road (Fig. 2) is known to have escaped fire for at least the time (39 years) the University has owned the land. No other remnant of Banksia woodland on the Swan Coastal Plain is known to the Botany staff to have survived free of fire for so long. Immediately north of this site is an area containing individuals of Actinostrobus pyramidalis known to be over 160 years in age. Since this species is readily killed by fire it is likely that parts of this area have also been fire-free for a long time.

From her observations, Baird (1984) has concluded that vegetation recovery on the flats is much slower than regeneration on the ridges where a fire cycle of about 9 years would seem tolerable.

One of the unfavourable results of repeated fires is to facilitate invasion by weed species. However, excessive numbers of firebreaks can also assist the invasive process. The fire protection objectives and strategies are designed to reduce the impact of fire while minimizing problems from weeds.

3.2 Fire Protection Objectives

- To protect human lives (visitors, neighbours and departmental staff) from wildfire entering or burning within the Reserve.
- To protect property of neighbouring landholders and Reserve facilities from damage by uncontrolled wildfires.
- To protect flora, fauna and landscape values from severe damage by uncontrolled fires or from inappropriate burning regimes or suppression techniques.

- To confine fires to less than 30% of total Reserve area in any one single fire event.

- To maintain ecological diversity and natural processes (e.g. succession) through implementation of a combination of fire management regimes including the maintenance of "No Planned Burn" zones.

- To reduce the risk and frequency of wildfires starting within or near the Reserve resulting from human activity.

3.3 Fire Protection Strategies

Eight fire management strategies have been developed, these are listed below:

- Maintenance of low fuel buffers.

- Development and maintenance of internal buffers.

- Prescribed burning operations.

- Fire suppression.

- Liaison.

- Visitor protection and safety.

- Water supplies.

- Fire research.

3.4 Fire Protection Actions

The fire prevention and suppression actions required to meet the objectives are given below. The Department of Botany will consult further with CALM on all aspects of these proposals prior to their implementation.

3.4.1 Maintenance of Low Fuel Buffers

Actions required are:

* Reduction of inflammable material, specifically weeds, along the boundary road reserves, including those fronting Lots 77 and 78. All work to be carried out in consultation with the Department of Botany.

* Boundary firebreaks will be maintained free of vegetation as required by the local Council. Consideration must be given to developing a system that minimises build-up of banks at the edges of the firebreaks as these harbour and promote the spread of weeds (see also Section 7.4).

3.4.2 Development and Maintenance of Internal Buffers

Action is required as follows:

* - Establishment of a southern extension of the central firebreak to link with the firebreak running parallel to Bickley Road (Fig. 2).

\- Internal firebreaks are not to be graded on an annual basis but only as required in order to minimise dispersal of weeds.

* - For teaching purposes it is desirable to maintain a fire succession within the Reserve. Given the small size and fire history of the Reserve ecologicl considerations should, in general, override fuel reduction considerations. Thus, compartments 1-4 shown within Fig. 2 are to be burnt at irregular intervals and not less than 8 years. The area comprising compartment 2 has not been burnt for >40 years and is to be exempt from this provision. Evidence indicates most wildfires enter the Reserve from the Brook Road boundary. For this reason the road verge to Brook Road should be treated by an appropriate pre-fire suppression procedure every 2 to 3 years. The western halves of compartments 1 and 3 are to be monitored, with the assistance of CALM, to ensure fuel loads do not exceed 8 tonnes ha^{-1} within the 8 year time span.

3.4.3 Prescribed Burning Operations

Action required as follows:

\- All burns must comply with a written prescription approved by the Department of Botany in consultation with appropriate authorities (local Council and CALM). These must include consideration of the environmental impacts of burning on research sites, any known rare flora and fauna.

3.4.4 Fire Suppression

Action required as follows:

\- An inter-agency fire suppression agreement is to be drawn up between the University of Western Australia (Botany Department), the local council, Bush Fires Board, W.A. Fire Brigade and CALM.

Wildfires in or threatening the Reserve will be contained to the smallest possible area either by direct attack or by backburning from established buffers or firebreaks, taking into consideration the likely threats to life and property and the impact of the suppression activity on the environmental management objectives of the Reserve.

\- Procedures and arrangements for actions in case of wildfires are to be listed in the Fire Control Working Plan. This must include an inventory of fire-fighting resources available in the district.

3.4.5 Liaison

University staff will maintain close liaison with the Gosnells Shire, local Bush Fire Brigades and Reserve neighbours to encourage mutual aid in fire prevention, detection and suppression activities in or near the Reserve.

3.4.6 Visitor Protection and Safety

No specific action is envisaged at this stage.

3.4.7 Water Supplies

Action required as follow:

* - No water supply is available to the block at present. Consideration might be given to the establishment of a water point(s).

3.4.8 Fire Research

- Aspects of the impact of fire upon the flora and fauna of the Reserve will be expected to form an important component of the Department of Botany research programme.

4. DIEBACK PROTECTION

4.1 Introduction

Dieback is not presently known to occur on the Reserve. The assistance of CALM will be sought in making a general survey in autumn 1988.

4.2. Management Objectives

To prevent the spread and minimise the impact of dieback and other disease on the environment.

4.3 Policies and Strategies

Appropriate policies and strategies for dieback protection as advised by CALM will be implemented.

4.4 Action for Dieback Protection

To maximise dieback protection, firebreak maintenance is to be carried out when soil is dry, subject to the provisions of the local council by-laws. Vehicles are to be washed down prior to entering the Reserve for firebreak maintenance or other purposes. Soil movement from one part of the Reserve to another is not permitted.

5. NOXIOUS WEEDS/FERAL ANIMALS, RUBBISH

5.1 Introduction

There has been no complete inventory made of the number of weed/feral animal species and their abundance on the Reserve. Rabbits are common, dogs are known to enter the Reserve from neighbouring properties. It is probable that with the proposed residential development south of Lots 77/78 cats could become more frequent. Weed species are widespread (see Baird 1984), however, it is not realistic on such a small Reserve within an urban area to consider eradication of all weeds.

5.2 Management Objectives

To control the abundance and spread of noxious weeds and feral animals, and accumulation of rubbish.

5.3 Policies and Strategies

Control techniques will conform with advice of appropriate authorities such as CALM and Department of Agriculture.

5.4 Action for Control

Data on presence, distribution and abundance of noxious weeds and feral animals are required. Where weeds or feral animals are considered to be a significant threat to conservation values (particularly rare species), a suitable control programme is to be implemented, with the approval of the Department of Botany.

* If Lots 77 and 78 are leased, some control of weeds by the lessees should be required. This would include the removal of all rubbish.

6. RARE OR ENDANGERED SPECIES

6.1 Introduction

The only rare species presently known to occur on the Reserve is Drosera occidentalis of which ca 200 individuals have been counted. A new species of native bee (Euryglossa tubulifera sp. n.) has been recently described (Houston 1983) but this is also known to occur outside the metropolitan area.

6.2 Management Objectives

To protect rare and endangered flora and fauna.

6.3 Policies and Strategies

Protection procedures will conform with CALM policy and Operational guidelines prepared for rare flora protection.

6.4 Actions for the Protection of Rare Species

- The Department of Botany will hold copies of the maps and lists of known rare and endangered species as they are advised by CALM.

- Known locations of rare flora and fauna must be shown on operation plans and are to be protected from inappropriate burn regimes, roadworks, firebreak construction and other disturbance (Because of its growth habit D. occidentalis is unlikely to be directly affected by fires).

- When disturbance of declared rare flora is unavoidable, an application for a Ministerial permit to "take" the flora will be required.

7. MAN-MADE DISTURBANCE

7.1 Introduction

Apart from the existing firebreak system there is no evidence of major problems due to man-made disturbance within the Reserve. It is recognised, however, that surrounding developments will, over the longer-term, have indirect effects upon the Reserve. Research projects will at times necessitate some disturbance to specific areas.

7.2 Management Objectives

To minimise the likelihood of disturbance and to rehabilitate edges of firebreaks disturbed by present grading practices.

7.3 Policies and Strategies

A policy will be prepared.

7.4 Actions for Protection

- As far as possible, all activities within the Reserve must be carried out in ways that complement rather than detract from the visual, aesthetic and scientific qualities of the Reserve environment.

- Areas affected by soil disturbance are to be rehabilitated by ensuring, in the first instance, that litter cover is replaced, and in the longer-term that indigenous plant species are replanted.

* - Banks formed along existing firebreaks are to be pulled down to base level and indigenous plant species replanted.

8. ARCHAEOLOGICAL AND HISTORIC SITES

8.1 Introduction

Aerial photographs show part of the Reserve to be covered by a series of dark parallel bands. The origin of these is unsubstantiated but 'rumour has it' that attempts were made around the turn of the century to drain the site for establishment of grape-vines. The Reserve has long been a favourite collecting site for botanists, local and overseas (Speck and Baird 1984). The Reserve has no known aboriginal significance.

8.2 Action

No action is proposed.

9. FACILITIES AND ACCESS MANAGEMENT

9.1 Introduction

No specific building facilities for the use of the Reserve by the Department of Botany are presently available. If in the longer term the Reserve were to be developed for use by other appropriate groups (e.g. schools), consideration as to provision of facilities (e.g. workroom, toilets, trails et.) would be required. Of more immediate concern, given the proposed residential development, is adequate fencing and access control.

9.2 Objectives

To control access by humans and animals so that the essential character of the Reserve is protected.

9.3 Policies and Strategies

Access by unauthorized persons and animals will be minimized. In respect of Lots 77 and 78 it is anticipated that local residents could have access to these areas but not the main Reserve.

9.4 Actions Required

* - The main Reserve (Lots 9-16) will be fenced with a plastic coated cyclone type mesh 1.2 m high fixed to galvanised steel posts or termite treated pine posts. Lockable access gates will be provided along Brook, Bickley and Boundary Roads at locations determined by the Department of Botany.

* - Information-type signs will be erected along each road frontage. CALM will advise on suitable types.

* - A 2 m high security type fence will be erected by the Developers of Lots 35 and 48 along the Bickley Road frontage to Lots 77 and 78. This is to discourage residents from crossing Bickley Road to the main Reserve.

- Keys to all access gates will be given to the local fire brigade authority.

* - The security officer appointed for the proposed development will carry out regular inspections of the Reserve to ensure that fences and gates are secure.

10. COMMUNITY INVOLVEMENT

In the longer term, consideration should be given to more direct community involvement as a means of increasing awareness of the value of the Reserve and its flora and fauna. Interested members of the community could be invited to assist with aspects of weed control, rubbish and litter removal, long-term monitoring and data collection.

11. TERM OF THE INTERIM GUIDELINES

The Interim Guidelines for Operations in the Yule Brook Reserve are intended to provide a basis for the annual works programme and job prescriptions for the protection of persons, property, flora and fauna in the Reserve funding completion of a formal overall Management Plan.

A major revision will be held at 5 years from the date of implementation of these Guidelines unless preceded by a completed full management plan. The Interim Guidelines will be reviewed and updated annually as further information becomes available. The advice of CALM will be sought where appropriate.

12. REFERENCES

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Stephens, L. (1985). Phenological responses of selected species from the Yule Brook Reserve, Kenwick. MSc Thesis, University of Western Australia.

5th August 1987

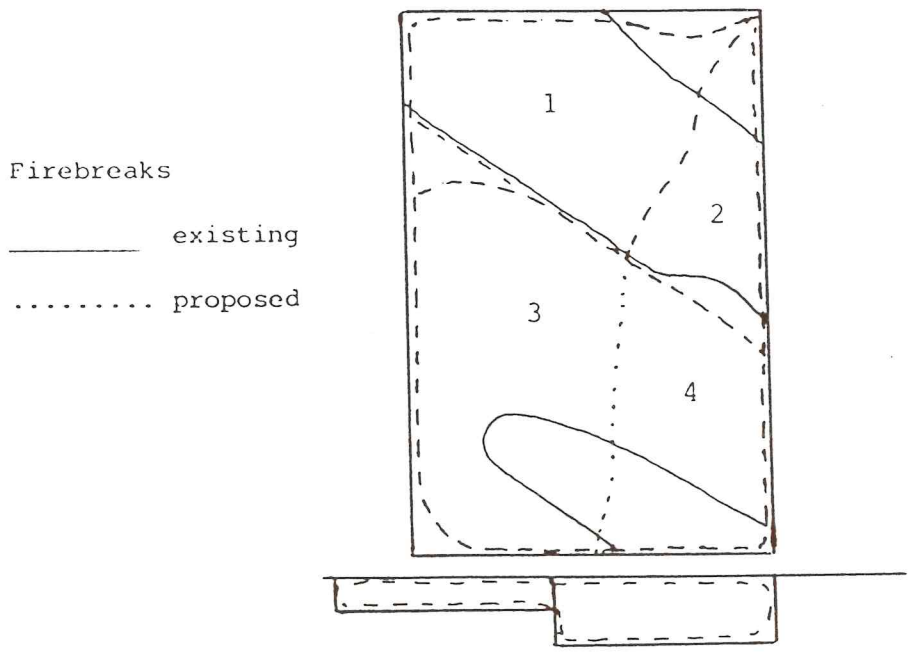

Fig. 2 Firebreak system within Reserve