M12

shire of wanneroo

POST OFFICE BOX 21 WANNEROO WESTERN AUSTRALIA 6065
TELEPHONE: 405 0333
ALL COMMUNICATIONS TO BE ADDRESSED TO THE SHIRE CLERK

YOUR REF: 6/1.9.1 - 237641

OUR REF: 198/76 IB:tg

ENQUIRIES: Mr P J Thompson

19 January 1983

The Director
Department of Conservation and Environment
1 Mount Street
PERTH 6000

ATTENTION: MR I. BRIGGS

Dear Sir,

RESERVE A20091, MARANGAROO - SYSTEM 6 STUDY

I refer to your letter of 10 January 1983 and wish to thank you for your advice of continuing availability of assistance from your Department.

Regarding the current situation in respect to the preparation of the management plan for the reserve, I wish to advise that :

1. A response has now been received from the Metropolitan Region Planning Authority (a copy is attached for your information).

2. A detailed base-plan is currently being prepared.

It is intended that a meeting of officers of the various Government departments involved be arranged for the near future and your department will be contacted soon in this regard.

Yours faithfully,

J P WATSON
ACTING SHIRE CLERK

PJT:tg

805-2-20-1 MRS A

Mr K Foley

7/8. 74

SHIRE PRESIDENT	
COUNCILLORS	
SHIRE CLERK	
COMMUNITY SERVICES	
TECHNICAL SERVICES	
TOWN PLANNING	✓
FINANCE	

The Shire Clerk
Wanneroo Shire Council
PO Box 21
WANNEROO WA 6065

ATTENTION: MR F THOMPSON

234287 19 NOV. 82

Dear Sir

POSSIBLE SECTION 33A MRS AMENDMENT: 'URBAN DEFERRED' TO 'PARKS AND RECREATION' - RESERVE A20091; LOTS 1,2 & PT. LOC [illegible]; VACANT CROWN LAND; CLOSED ROAD; AND PART OF RESERVE 26058 AT MARANGAROO.

I refer to your letter of February 12, 1982, in which you requested the Authority's views regarding the possible reservation of Crown Reserve A20091 and adjoining land (88Ha) for 'Parks and Recreation' in the Metropolitan Region Scheme.

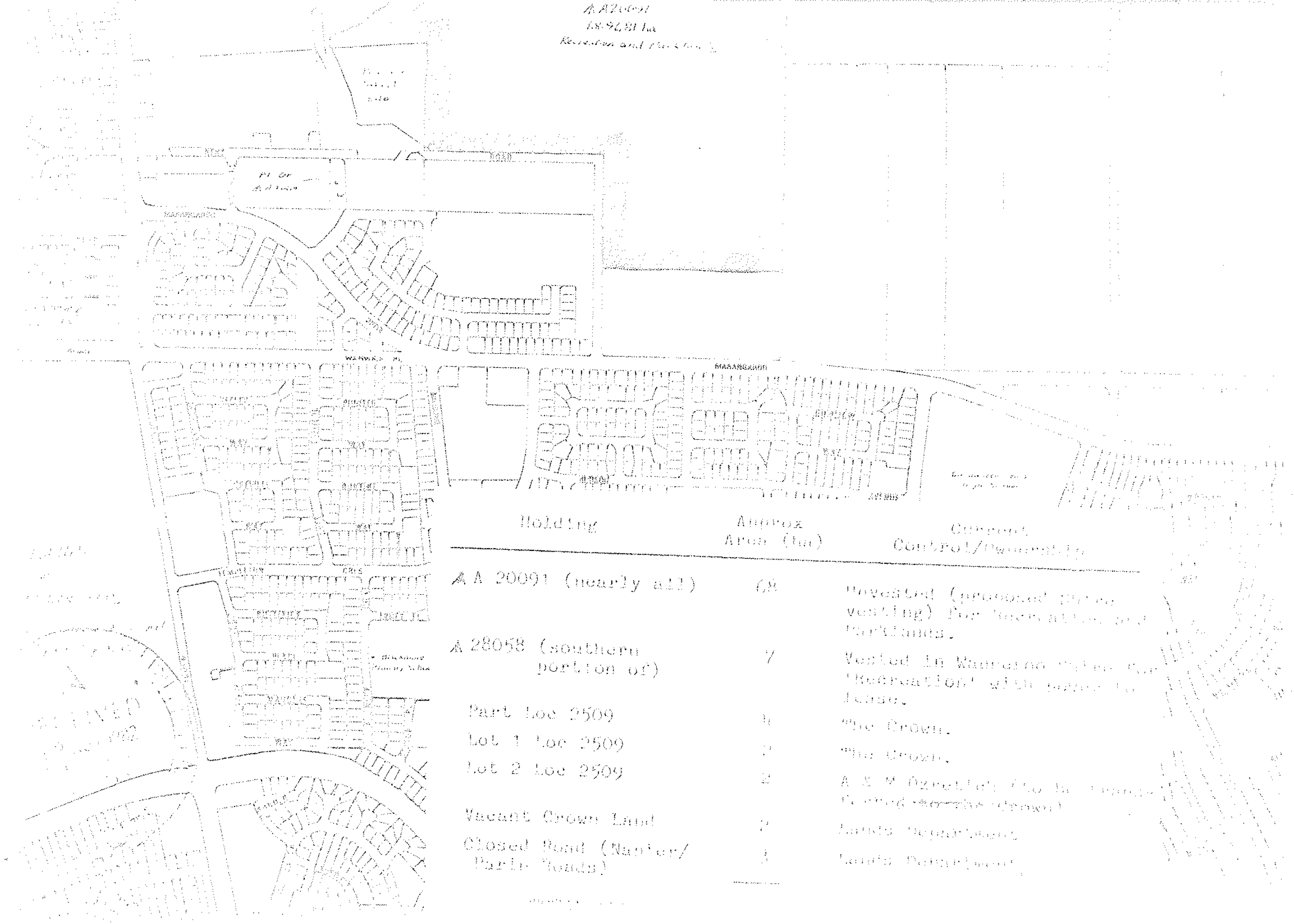
The matter has been investigated and it appears that conservation with passive recreation would be among the appropriate uses for the land. The provision of schools and other services in the area has been based on the assumption that the reserve would not be needed for urban purposes.

The most appropriate course of action is for your Council to formally request the Authority via the Group 'F' District Planning Committee to initiate an amendment to the Scheme once land ownership has been consolidated, the land is vested in Council, and proposals are made for future recreation uses and ongoing management. The relationship of the land to the Kingsway Sporting Complex and the Hepburn Avenue reservation are matters that your Council could also consider.

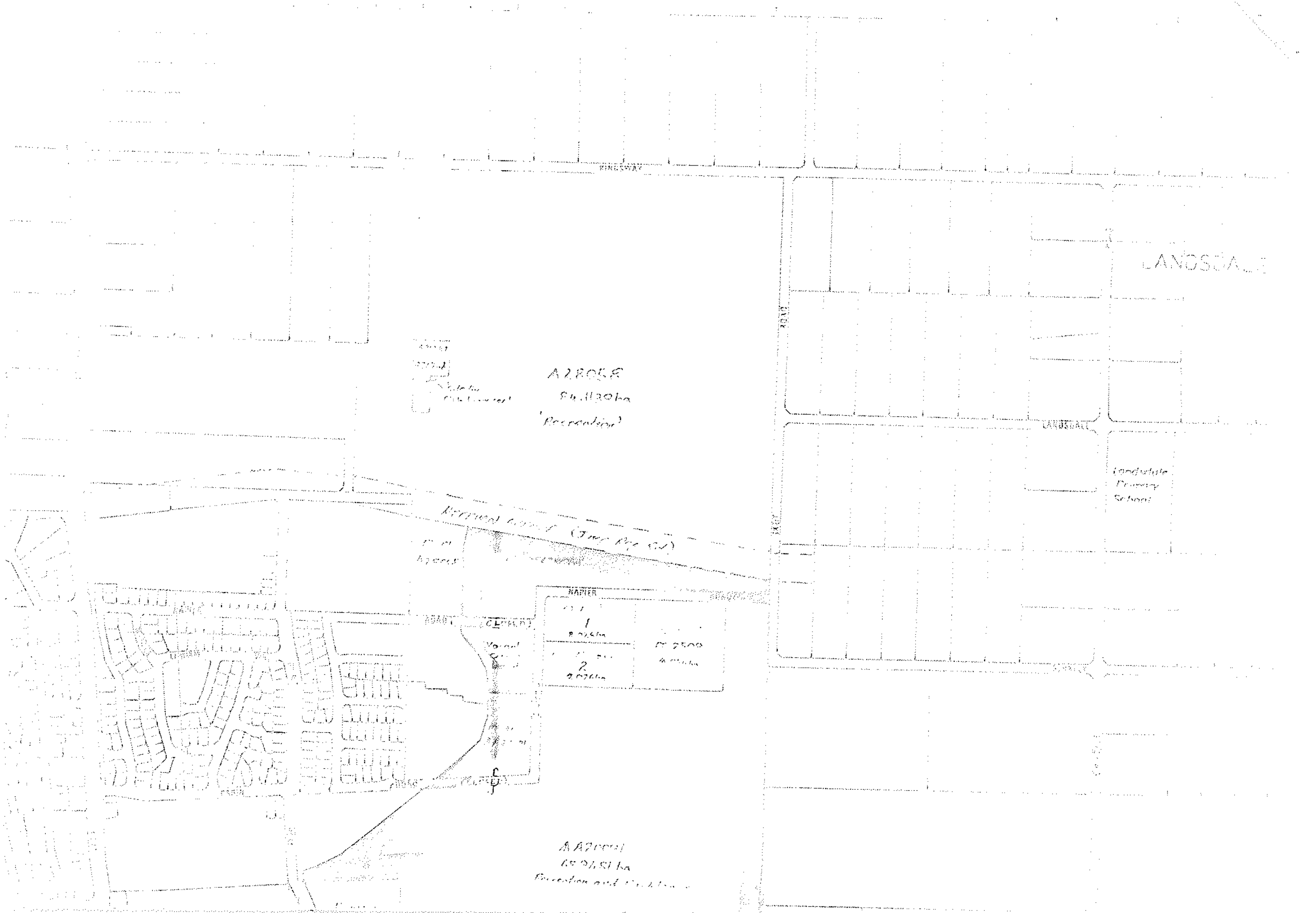
Yours faithfully

[illegible]

[illegible] 1982



Holding	Approx Area (ha)	Current Control/Ownership
A 20091 (nearly all)	68	Unvested (proposed [illegible] vesting) for Recreation and Parklands.
A 28058 (southern portion of)	7	Vested in Wanneroo Shire for 'Recreation' with power to lease.
Part Loc 2509	4	The Crown.
Lot 1 Loc 2509	2	The Crown.
Lot 2 Loc 2509	2	A & M Ozretich (to be [illegible] to the Crown)
Vacant Crown Land	2	Lands Department
Closed Road (Napier/Parin Roads)	3	Lands Department.



KINGSWAY
LANDSDALE
ROAD
NAPIER
CLEMENT
Landsdale Primary School

The Shire Clerk,
P.O. Box 21,
WANNEROO, 6065

7/8 7A
198/76 IB:tg
I. Briggs

Attention: Mr. P.J. Thompson

Dear Sir,

RE: REVERVE A20091, MARANGAROO

Thank you for your letter of February 15, 1982 regarding the above reserve. This Department's responses to the four points you have listed for comment are as follows:-

1. The intention of the System 6 Committee's recommendation to change the purpose of Reserve A20091 from 'Parkland and Recreation' to 'Parkland' was to ensure that the reserve is managed for passive recreation rather than active recreation (e.g. formal sports fields) which would necessitate considerable disruption to the natural environment within the reserve. In the light of a recent field inspection, this Department supports this view.

2. An amendment of the Metropolitan Region Scheme zoning for Reserve A20091 from 'Urban Deferred' to 'Parks and Recreation' would be supported by this Department. 'Parks and Recreation' zoning for the reserve would reflect its purpose and its regional significance.

3. The System 6 Conservation Reserves and National Parks Committee Report on Reserve A20091 is enclosed. This provides a more detailed account of the natural vegetation found in the reserve. Although written in 1978, this information is still accurate.

4. Officers of this Department would be pleased to assist in the preparation of a management plan in close consultation with your staff. Please contact us to arrange a meeting when you are ready to commence preparation of the plan.

Yours faithfully,

C.F. Porter
DIRECTOR
18th March, 1982

F.9 RESERVE AT MARANGAROO

03

Reserve A20091, of 77 ha, lies east of Wanneroo Road and north of Warwick Road, in the suburb of Marangaroo. It is for Preservation of Flora and Fauna, and is vested in the Shire of Wanneroo.

The soil is mostly yellow sand, characteristic of the Karrakatta Soil-landform Unit (Churchward and McArthur 1978). It supports open-woodland of Jarrah *(Eucalyptus marginata)* with an understorey of Banksia *(B. attenuata* and *B. menziesii)* and the occasional Sheoak *(Casuarina fraserana)*. Common species of the ground storey include Blackboy *(Xanthorrhoea preissii)*, Blueboy *(Stirlingia latifolia)*, *Patersonia occidentalis*, Bristly Cottonheads *(Conostylis setigera)*, Bacon-and-eggs *(Oxylobium capitatum)*, *Daviesia pectinata*, *D. nudiflora*, *D. divaricata*, *D. juncea*, Telegraph Sedge *(Mesomelaena stygia)*, Pixie Mops *(Petrophile linearis)*, *Conostephium* sp., Pink Myrtle *(Hypocalymma robustum)*, Summer Starflower *(Calytrix flavescens)*, *Eremaea* sp., *Scaevola paludosa*, Buttercups *(Hibbertia hypericoides* and *H. huegelii)* and Star-of-Bethlehem *(Calectasia cyanea)*.

In the extreme western portion of the reserve is higher ground, of yellowish-brown sand. It is vegetated with woodland and open-woodland of Tuart *(E. gomphocephala)*, with less Banksia and more Sheoak. The understorey is noticeably dissimilar from the remainder of the reserve: although species such as *Hibbertia hypericoides*, *Daviesia nudiflora* and *D. divaricata* remain common, it is largely characterised by different species, such as *Helichrysum cordatum*, *Tetrariopsis octandra*, *Dianella revoluta*, *Corynotheca micrantha*, *Grevillea vestita*, *Hibbertia racemosa*, *Pelargonium capitatum* and *Jacksonia sericea*.

A large portion of the reserve was burnt in 1977-78. The remainder, however, has also been burnt in recent years; the understorey is low and open. The reserve has also been affected by timber-cutting and rubbish-dumping, the latter particularly in the east where car bodies line tracks into the reserve. So far the reserve has retained a good diversity of plant species and there appears to be little invasion of weeds.

The Committee endorses the vesting of reserve A20091 in the Shire of Wanneroo.

RECOMMENDATION

The Committee recommends that the purpose of reserve A20091 be changed to Parkland.

NOTE TO FILE

The basis of the System 6 Recommendation M13.1 that the purpose of Reserve A20091 be changed from 'Parkland and Recreation' to 'Parkland' is as follows:

1) There is a large sporting complex to the north of the reserve devoted to many types of active recreation including baseball, football, soccer, cricket, hockey and basketball.

2) Reserve A20091 contains a good diversity of plant species with little invasion of exotic plants.

The reserve provides an opportunity of retaining an example of local indigenous vegetation while catering for recreation of a passive nature requiring relatively little maintenance. Since the playing fields to the north cater for active, high maintenance recreation, there appears to be no need to include recreation as a purpose of Reserve A20091.

Site Inspection:

A site inspection of the area on 11/3/82 revealed that dumping of car bodies and other rubbish is a serious problem, especially along the main tracks leading through the reserve.

The proposed addition to the reserve suggested by the Wanneroo Shire is mostly uncleared [illegible] of Jarrah and Banksia. Banksia woodland in the north-eastern corner has recently been burnt. Most along the western margins of the reserves appears to be under stress, but vegetation in the central part of the reserve appears to be in good condition except along the edges of tracks where weeds, human traffic and rubbish have had an effect.

[signature]

M 1.2

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shire of wanneroo

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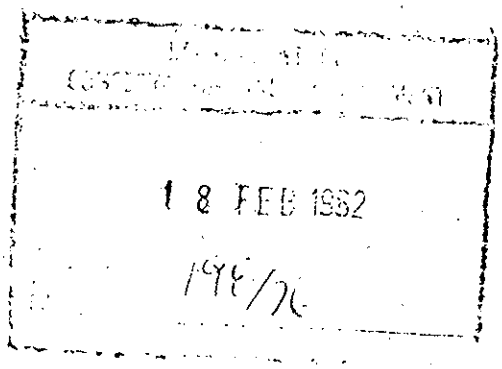
WHEN REPLYING PLEASE QUOTE

ENQUIRIES Mr P J Thompson

OUR REF 7/8.7A

YOUR REF



15 February 1982

The Director
Department of Conservation and Environment
1 Mount Street
PERTH WA 6000

Dear Sir,

RESERVE A20091, MARANGAROO

Prior to 1978, Reserve A20091 in Marangaroo (shown on the attached plan) was vested in the Shire of Wanneroo for the purpose of Flora and Fauna. In 1978, to facilitate implementation of Council's Town Planning Scheme 7A and to rationalise the purpose of the reserve, the Vesting Order was revoked and the purpose changed to its present designation of Recreation and Parkland.

Advice has recently been received from the Department of Lands and Surveys that it is the intention of that Department to re-issue a Vesting Order over the reserve to this Council for the amended purpose, following receipt of suitable plans indicating future usage of the reserve.

In your Department's System 6 Study Report to the Environmental Protection Authority, it has been recommended that the purpose of Reserve A20091 should be amended to Parkland and the reserve should be vested in this Shire. This Council, in its response to the System 6 Report forwarded to your Department on 19 October 1981, commented (on page 61) that the System 6 recommendation M 12.1 is supported, but that the stippled boundary on Figure 87 should be amended to coincide with the rationalised boundary created by land exchanges through Council's Town Planning Scheme 7A.

To assist in the preparation of the plan required for this reserve, your comments on the following matters would be appreciated :-

1. The basis of the System 6 recommendation M 12.1 that the purpose of Reserve A20091 should be amended to Parkland. (Attached for your information is a copy of a letter sent to the Under Secretary for Lands wherein the recommendation of that Department is sought as to whether the purpose "Recreation and Parkland" or the purpose "Parkland" should be assumed in preparing the plan for the area).

07 55

2. The suitability of the current zoning of this reserve under the Metropolitan Region Scheme as Urban Deferred (the Metropolitan Region Planning Authority is also being consulted in this regard).

3. Information on the environment of this area which your Department can make available, further to that contained in the System 6 Study Report.

4. What you consider a plan for this reserve should entail.

Yours faithfully,

J D REIDY-CROFTS
SHIRE CLERK

PJT:GM

Encl.

Enclosure

Original file

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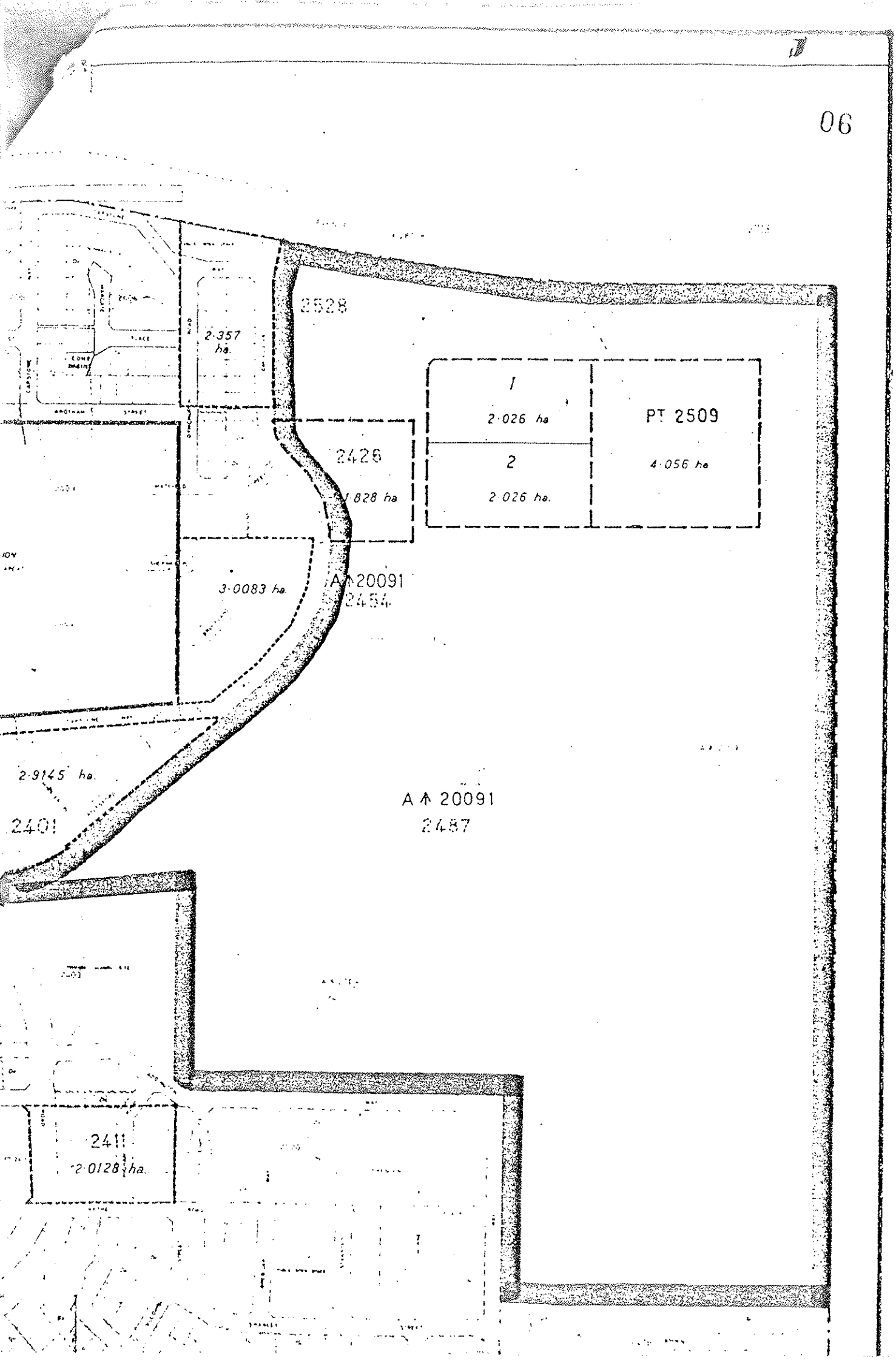
2528
2·357 ha.
1
2·026 ha
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PT 2509
4·056 ha
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2·9145 ha.
2401
A↑20091
2487
2411
2·0128 ha.

MARANGAROO RESERVE: VEGETATION SURVEY

FOR

SHIRE OF WANNEROO

BY

W.G. MARTINICK & ASSOCIATES PTY LTD

SEPTEMBER, 1983

I N D E X
****

1. SUMMARY

A vegetation survey of the Marangaroo reserve has been carried out to establish which areas have the highest conservation value. The reserve is now vested for Parkland.

The vegetation was divided into four types and these have been described and mapped. The vegetation was found to be in good condition over most of the reserve, but with some areas affected by excessive burning and disturbance. These latter areas are associated with exotic species.

The conservation status of the different areas is discussed. The effect of possible lowering of the water table is also discussed.

Certain parts of the reserve have significant conservation value and recommendations are given for the management of these areas. Conservation of these areas is compatible with development of the reserve as an urban Parkland with recreational facilities. Recreational facilities should be concentrated on areas of vegetation which have already been disturbed and should not conflict with the conservation value of the area.

2. INTRODUCTION

The present study relates to Reserve A 20091; Lots 1, 2 and Pt. Loc. 2509; vacant Crown Land; a closed road and Pt. Reserve 28058, known as Marangaroo Reserve (see Map 1). The area was reserved for Parkland and Recreation; ~~this was unvested and it~~ the purpose has been amended and the reserve is now vested in the Shire of Wanneroo for Parkland.

3. AIMS AND OBJECTIVES

This study has been carried out to assess the conservation value of the reserve. Specifically the objectives were to:

- Describe and map the vegetation
- Review the current state of the vegetation and map the different areas
- Review the effect of groundwater withdrawal on the native vegetation, and
- Define and map the priorities for conservation within the reserve.

4. BACKGROUND INFORMATION

The soils consist of deep, yellow to brown sands overlying limestone. Some local variation in surface soil colour was noted, which appears to relate to leaching. The topography of the area is slightly undulating with elevations ranging from 45 metres (above sea level) in the lower lying depressions to 60 metres on the eastern, northern and western perimeters. The soils in the depressions appear to be seasonally moist, but no wetlands are present in the Marangaroo study area.

The landforms and soils are typical of the Karrakatta soil association which forms part of the Spearwood Dune System (Bettenay, McArthur and Hingston 1960), which has been mapped in the System 6 area by Churchward and McArthur (1980).

The vegetation on the Swan Coastal Plain was initially classified by Speck (1952). This work was later summarised by Seddon (1972). The classification by Speck was largely qualitative and descriptive.

In 1968 Havel defined a series of site-vegetation types for the northern Swan Coastal Plain. His quantitative approach enabled the selection of a series of indicator species which reflected particular site conditions on the Spearwood Dune System.

Beard (1979) mapped the eucalypt woodlands on the Spearwood system as two communities; the Tuart *(Eucalyptus gomphocephala)* association and the Tuart-Jarrah (*E. gomphocephala - E. marginata)* association. *E. gomphocephala* was noted to prevail on ridges while *E. marginata* preferred depressions.

Heddle, Loneragan and Havel (1980) mapped a series of vegetation complexes for the northern Swan Coastal Plain and their approach supported the earlier studies of Havel.

5. METHODOLOGY

5.1 Photo interpretation:

A 1:2000 colour aerial photograph (1982) was used to indicate the variation in overstorey tree density and plant cover within the reserve. Disturbance patterns and other features were also noted for field inspection.

5.2 Field survey and data collection

The survey was undertaken during mid-September 1983, the optimum flowering period for many perennial shrub and herbaceous understorey species. The area was extensively traversed and nineteen stands of vegetation typical of the various types on the reserve were selected for sampling. Species present at each site were recorded for an area of 1000m^2. Species occurring in vegetation outside the sampling areas, or on disturbed areas and tracks were also recorded. Also recorded were:

- variations in vegetation structure (density of tree overstorey, height and density of shrub layer);
- nature of dominant species;
- relative diversity and occurrence of exotic plant species.

5.3 Data analysis and mapping

The recorded observations were tabulated and species which may be indicators of different vegetation types were identified. Where species tended to group sites together, they were compared with different structural vegetation types and topographic features on the reserve. When these vegetation-site types were defined, the area was revisited and the extent and distribution of the various vegetation types was verified and mapped.

6. SURVEY RESULTS

6.1 Floristics and Classification

The distribution of sampling sites is shown on Map 1 and the most common perennial plant species and species useful in identifying vegetation types are shown in Table 1. A suite of sixteen species identifies the vegetation of the reserve to be typical of the communities present in the Karrakatta Dune System described by Heddle *et al* (1980).

There are four vegetation units which can be described and mapped using the structural terminology of Specht (1970); these are:

.. Jarrah-*Banksia* Woodland -
This unit represents much of the vegetation of the reserve, and typically has an open canopy of jarrah and several

Banksia species, the most common being *B. Attenuata*. The common identifying species of the understorey is *Daviesia nudiflora*.

.. Jarrah - *Macrozamia* - *Xanthorrhoea* Low Open Forest - This unit is essentially a structural and floristic variant of the Jarrah-*Banksia* Woodland and occurs on the more moist soils in dune depressions. The unit is typified by a denser canopy cover of *E. marginata* with reduction of *Banksia* canopy and with *Xanthorrhoea preissei* and *Macrozamia riedlei* dominating the understorey. There is also a more frequent occurrence of *Hakea prostrata* and *Leucopogon propinguus* and occasional occurrence of the moist interdune indicators *Phlebocarya ciliata, Lepidosperma tenue, Dasypogon bromeliifolius, Acacia stenoptera* and *A. heugelii*.

.. Tuart-Jarrah-*Banksia* Woodland - The presence of identifying species *Eucalyptus gomphocephala, Acacia saligna, Pelagronium capitatum* and *Phyllanthus calycinus*, and increased cover of *Hibbertia hypericoides* differentiate this unit from the above. It is also typically associated with the more elevated ridges and dune crests with shallow yellow sands over limestone.

.. *Banksia* Low Woodland - This unit is dominated by *Banksia attenuatta* and, less frequently, the co-dominants *B. menziessii* and *B. grandis; B. ilicifolia* occurs occasionally. Identifying understorey species are *Anigozanthos humilis, Lyginia barbata, Synaphea polymorpha, Allocasuarina humilis*, and *Conospermum stoechadis*. This unit typically occurs on level or slightly undulating elevating dunes. In a small, localised area at site 16 (see Map 1), a variant of this unit occurs; this is identified by *Calytrix flavescens, Hakea ruscifolia* and *Jacksonia floribunda* and the conspicuous absence of many common *Banksia* understorey species. The extent of this variant is too small to warrant mapping.

6.2 Vegetation structure

Most of the vegetation within the reserve can be readily classified into the types described above on the basis of dominant species and structure; this facilitated the definition of mapping boundaries. The Jarrah-*Macrozamia*-*Xanthorrhoea* Low Open Forest (J-M-X) has the most dense jarrah overstorey and tall shrub cover, and has only occasional co-dominant tree species. Typical jarrah-*Banksia* Woodland (J-B) has the most diverse tree strata, with three *Banksia* species common and occasional *Banksia ilicifolia*. In addition, *Allocasuarina fraseriana* and *Nuytsia floribunda* are common trees. The shrub and sedge understorey is open and diverse.

The Tuart-Jarrah-*Banksia* Woodland (T-J-B) can be recognised structurally by the tall tuart canopy. The understorey is dense, with occasional tall shrubs, and is noticably less diverse than other areas. Herbaceous species are common during the Winter - Spring period.

The *Banksia* Low Woodland contrasts markedly with the previously described types with an open, homogenous tree strata and a low, open and diverse understorey of shrubs and sedges.

6.3 General

The distribution of many of the native plant species is not regular, but with occasional representation in various vegetation types. These species are listed in Table 2.

The timing of the survey allowed observation of most of the annually regenerating species; however, some ephemeral species such as winter orchids, may have been missed. Orchids are generally common throughout the reserve, in particular in the more elevated Jarrah-*Banksia* and *Banksia* Woodland areas.

Some species typical of early successional stages occur in the flora. These are native species which become more common in areas affected by disturbance, reducing species diversity. These include the tall shrub species *Adenanthus cygnorum*, *Hakea prostrata*, *Acacia saligna* and *Jacksonia furcellata*. *Banksia grandis* also appears more abundant in some open areas.

7. ASSESSMENT OF VEGETATION

7.1 Effects of fire

Observations on the effects of fire on the reserve produce three categories:

(a) Unburnt vegetation - two areas within the reserve have escaped recent fires and have a diverse and dense understorey. These areas are located in Jarrah-*Banksia* site 9 and in *Banksia* Low Woodland (west of site 4). These areas are consequently the most aesthetically pleasing examples of these vegetation types in the reserve.

(b) Recently burnt vegetation - most of the vegetation in the reserve has been recently burnt, and some areas, e.g. site 7, show the effects of particularly hot fires. Most of these areas are regenerating well and understorey plant diversity is comparable to the unburnt areas. In time these areas will not be distinguishable from undisturbed natural vegetation.

(c) Frequently burnt vegetation - some areas within the reserve, particularly along the western perimeter, have been subjected to many fires. Consequently, some elements of the flora have become depleted, causing a reduced diversity of native perennials. These degraded areas are delineated on Map 1. There has been an increase in exotic plant species (mostly annuals) associated with this degradation and this in turn has increased the hazard of further fires.

7.2 Exotic species establishment

The distribution of the majority of the exotic plant species is restricted to the mechanically disturbed areas and the fire degraded areas described above. Some small ephemeral exotic species are naturalised in most of the vegetation types, but these constitute a minute fraction of the total biomass of the vegetation. A list of exotic species present in the reserve is shown in Table 4 where the species are also classified on their ability to colonize undisturbed native vegetation, or whether they are

generally restricted to disturbed areas. The most undesirable species to invade Karrakatta complex vegetation are *Ehrharta* (Veldt grass), *Avena* spp (Wild Oats) and *Lupinus* spp (Lupins). Generally, the establishment of these species requires some form of disturbance of the natural vegetation (Bridgewater and Backshall, [illegible]).

7.3 Dieback

Some evidence of eucalypt dieback is noticeable in sections of the reserve. Tuart crown dieback is a common syndrome in vegetation on the Swan Coastal Plain and it is generally attributed to insect attack (Kimber, 1980). Jarrah crown dieback appears to be the result of past fire crown-scorch, the pattern expected with fungal dieback disease is not evident in the reserve.

7.4 Mechanical disturbance and rubbish dumping

Extensive tracks and some small areas of localised clearing occur in the reserve. Along some tracks extensive littering with garden and household rubbish and car bodies has taken place. Mechanical disturbance and dumping is still occurring on the reserve.

7.5 Effects of changing groundwater levels

The difficulty of predicting the influence of changing the levels of water availability on the native vegetation is dependent on the ability to understand these plant communities and their relationships to existing environmental conditions.

Earlier work on the northern Swan Coastal Plain illustrated that the main determinants of the vegetation were the degree of leaching undergone by the soils and the moistness of the site (Havel, 1968). Heddle (1980) found that most plant species are capable of tolerating a certain degree of natural fluctuation in rainfall and therefore soil moisture conditions. Species that did respond to a series of below average annual rainfall years between 1966 and 1976 were delineated as possible indicators of further change. Further results by Heddle indicated an intolerance of larger older trees to drought conditions; possibly due to their lower capacity to adjust to fluctuations.

Heddle related responses of the plants to their position in the topography: Species that occur on moister lower slopes and in depressions reacted more markedly to changes in local soil moisture conditions than those that occur on the drier upper dune slopes. These results supported earlier predictions by Havel (1975) and Aplin (1976) that if soil moisture conditions were reduced then there would be a shift towards the xeric end of the vegetation continuum.

In a small reserve such as the study area at Marangaroo, it is likely that the clearing for suburban development has had a significant influence on the water table. Based on earlier results, it is therefore predictable that the vegetation to be most likely affected would occur in the relatively disturbed Jarrah Woodland of the south-west corner of the study area. Although no wetland vegetation was observed in the reserve, this Jarrah Woodland occurs on moister soils and is therefore more likely to be affected by changes in soil moisture levels by clearing, underground water withdrawal or changes in land-use, both within or beyond the study area. If any changes are gradual, then the effects should be minimal. The results of Heddle (1980) indicate that plant communities on the drier sites will be only marginally affected. In the study area this covers the majority on the eastern and northern sections of the reserve.

7.6 Conservation status of the vegetation

In general terms the vegetation of the reserve approaches the natural condition of the Karrakatta complex type. With appropriate management to prevent further disturbance this state could be maintained. There are some degraded areas and these have very low conservation value. There are no gazetted rare or endangered species on the reserve.

8. CONCLUSIONS AND RECOMMENDATIONS

Only small areas of Karrakatta complex vegetation have been reserved for flora conservation and on that basis Marangaroo reserve has a significant conservation value. The reserve is also in a major urban area. This gives it aesthetic and recreational values as well. These values will become increasingly important as urbanisation increases and local residents become aware of the reserve.

The reserve also has some significance in a wider sense as part of a series of bushland areas throughout the suburbs of Perth. These reserves have a collective value for aesthetics and future land use options, as well as direct value for nature conservation such as in encouraging native birds to visit the suburbs.

Most of the reserve is in good condition, but will require active management to maintain this state. The areas which have been degraded already have low conservation priority and these could be developed to provide for human use of the area. Recreational use of the area should be restricted to activities which are compatible with the Parkland vesting of the reserve - such as walkways, bicycle paths, nature trails, picnic grounds and informal grassed areas. In this context the reserve should be compared with the nearby Warwick Woodland (vested for recreation) and the Kingsway Sporting Complex. A useful analogy can be drawn with Kings Parkwhich has a similar vesting and provides a good range of passive recreational activities.

For development of the reserve, nature conservation priorities are as follows (Map 2):

High - the least degraded areas, on the east and centre of the reserve.

Medium - the remaining areas which have not been degraded. This includes the areas most likely to be affected by lowering the groundwater levels. It also includes the Tuart area which, while not containing a large species diversity, has a high aesthetic appeal because of the Tuart trees.

Low - All areas already affected by littering, soil disturbance or excessive burning.

As recreational facilities are developed the following points should also be considered:

- Fire protection should be considered at all times.
- Examples of as many vegetation types as possible should be preserved, and in the order given above.
- The vegetation should not be divided into small isolated areas. This will benefit the fauna and

enhance the survival of the vegetation.

For management of the bushland areas the following recommendations are made:

1. Fires should be excluded so that excessive burning does not take place. After fire has been successfully excluded from the reserve for more than five years, consideration should be given to implementing controlled burns in consultation with the Department of Fisheries and Wildlife.

2. Vehicles should be excluded.

3. Soil disturbance and littering should be avoided.

4. Human use of the bushland should be restricted to paths where possible.

10. ACKNOWLEDGEMENTS

9. REFERENCES

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Table 1. Note The three groups are in reverse order. ie — ~~they~~ identifying species of higher groups at top
— identifying species middle
— less identifying species bottom

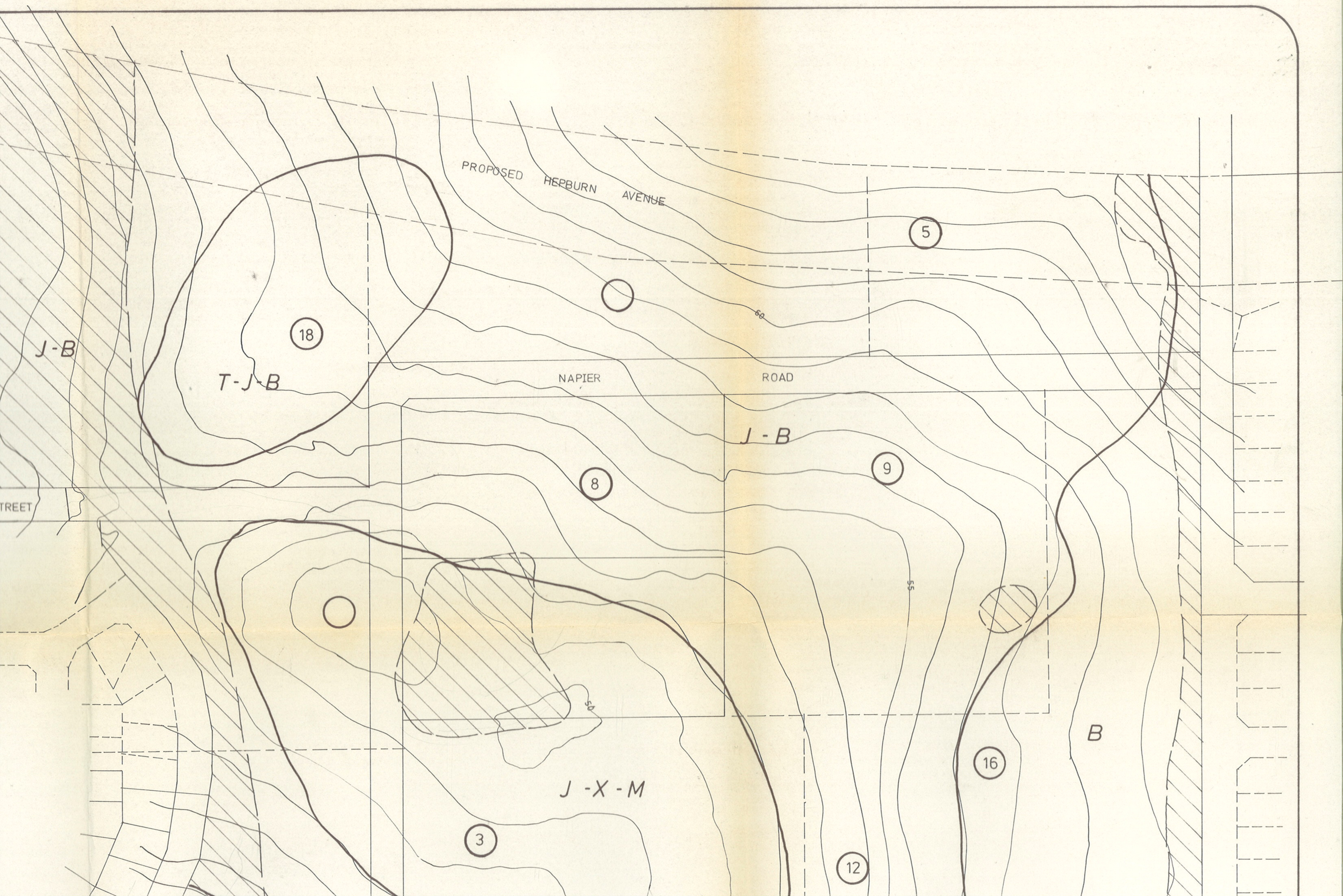
Caption. ~~Δ~~

Δ

Table 1. ~~S~~ Distribution of ~~important~~ identifying ~~[illegible]~~ native species in relation to sampling sites. The species are in three groups: ~~species ident~~ common species identifying higher vegetation units; species identifying the ~~units~~ types mapped in this study; ~~o~~ lesser identifying species.

"D" = dominant. "+" = present.

Table is not in final form — information is right though.


PROPOSED HEPBURN AVENUE
5
60
18
J-B
T-J-B
NAPIER ROAD
J-B
9
8
TREET
55
50
B
16
J-X-M
3
12

PROPOSED HEPBURN AVENUE

NAPIER ROAD

WROTHAM STREET

T-J-B

J-B

T-J-B

18

J-B

8

J-X-M

3

J -X - M

3

12

16

B

15

DRIVE

T - J - B

17

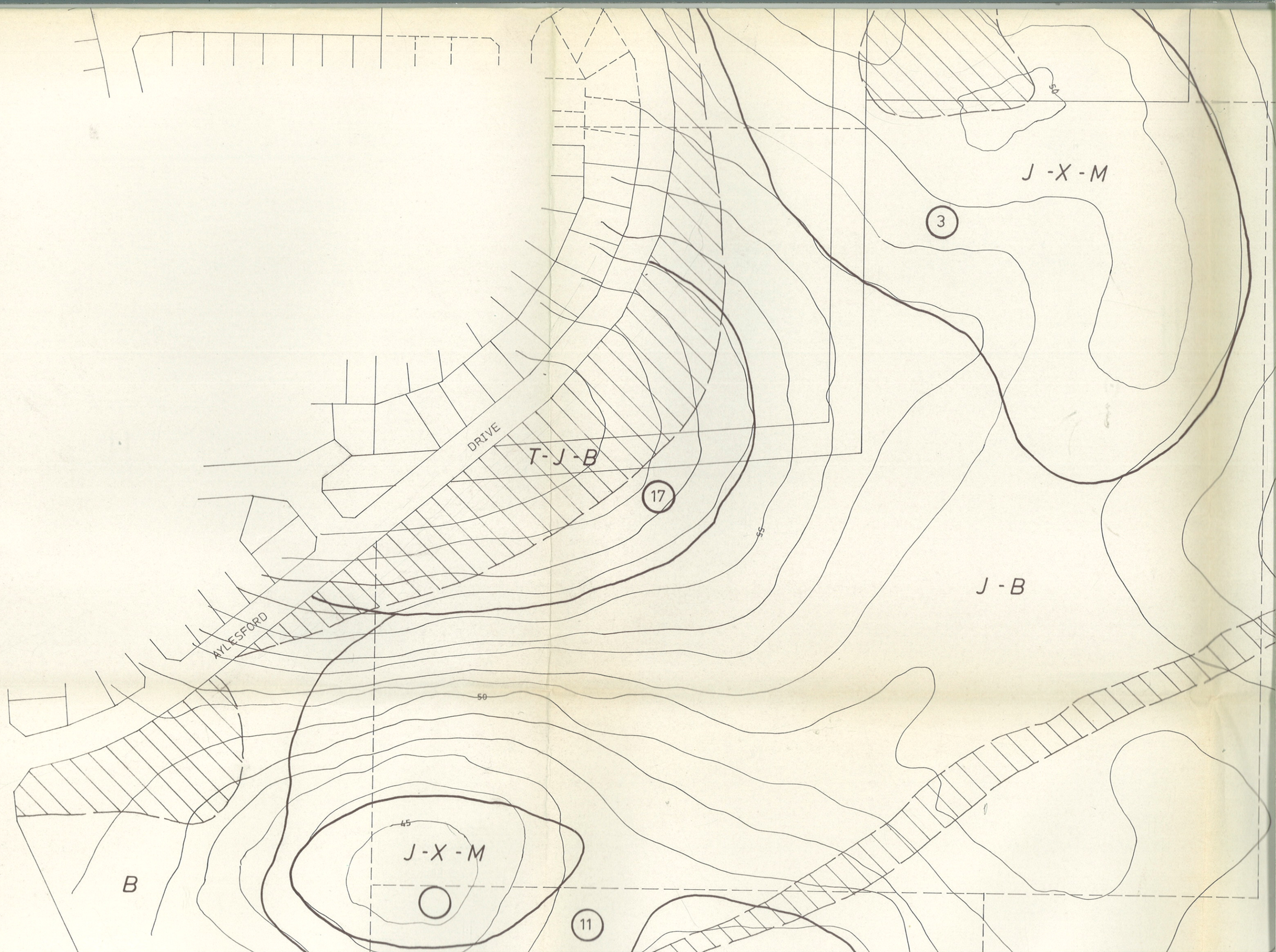
J - B

50

- M

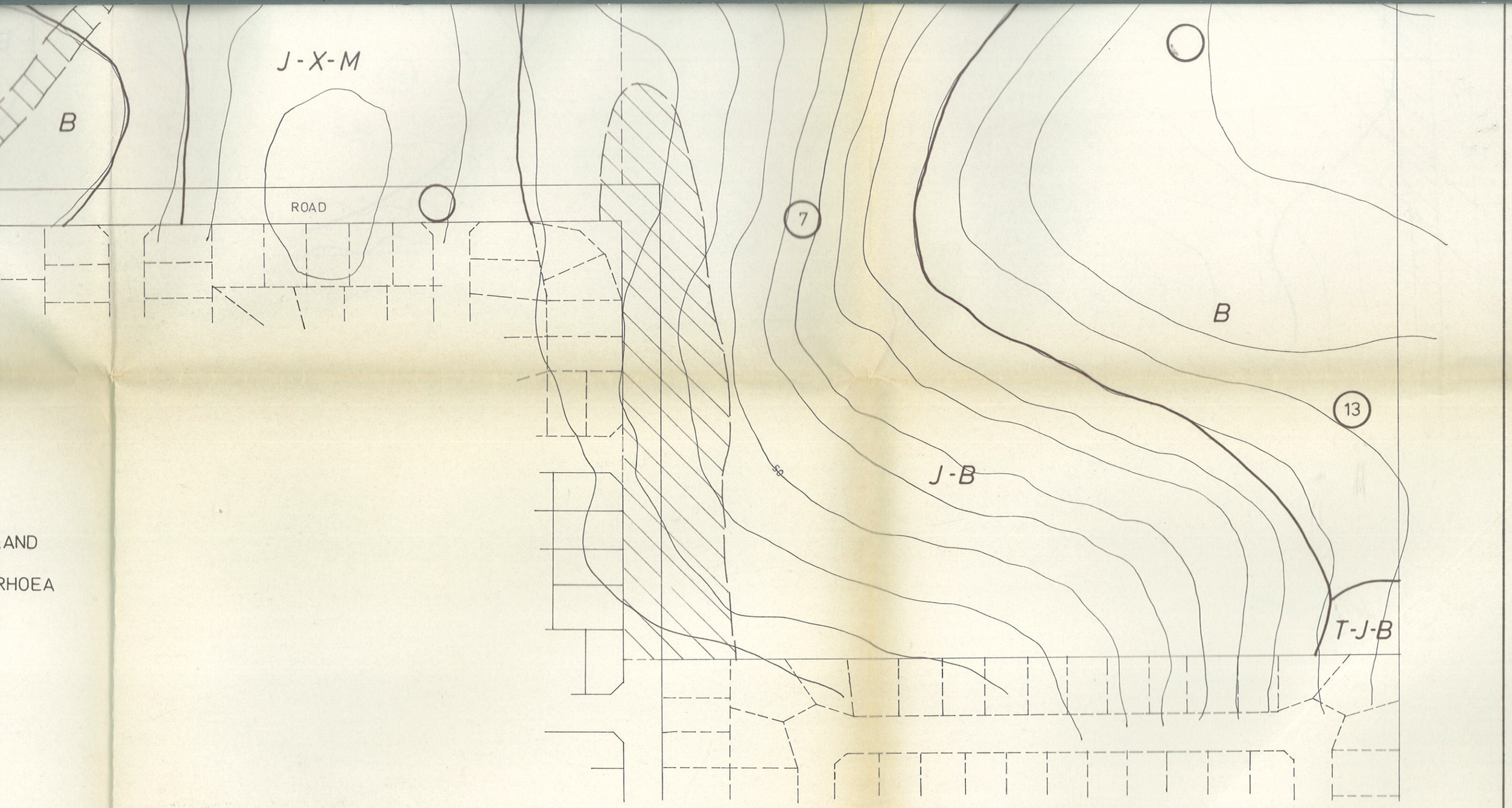
11

B


DRIVE
T-J-B
17
J-X-M
3
J-B
AYLESFORD
50
45
J-X-M
B
11

AND

RHOEA

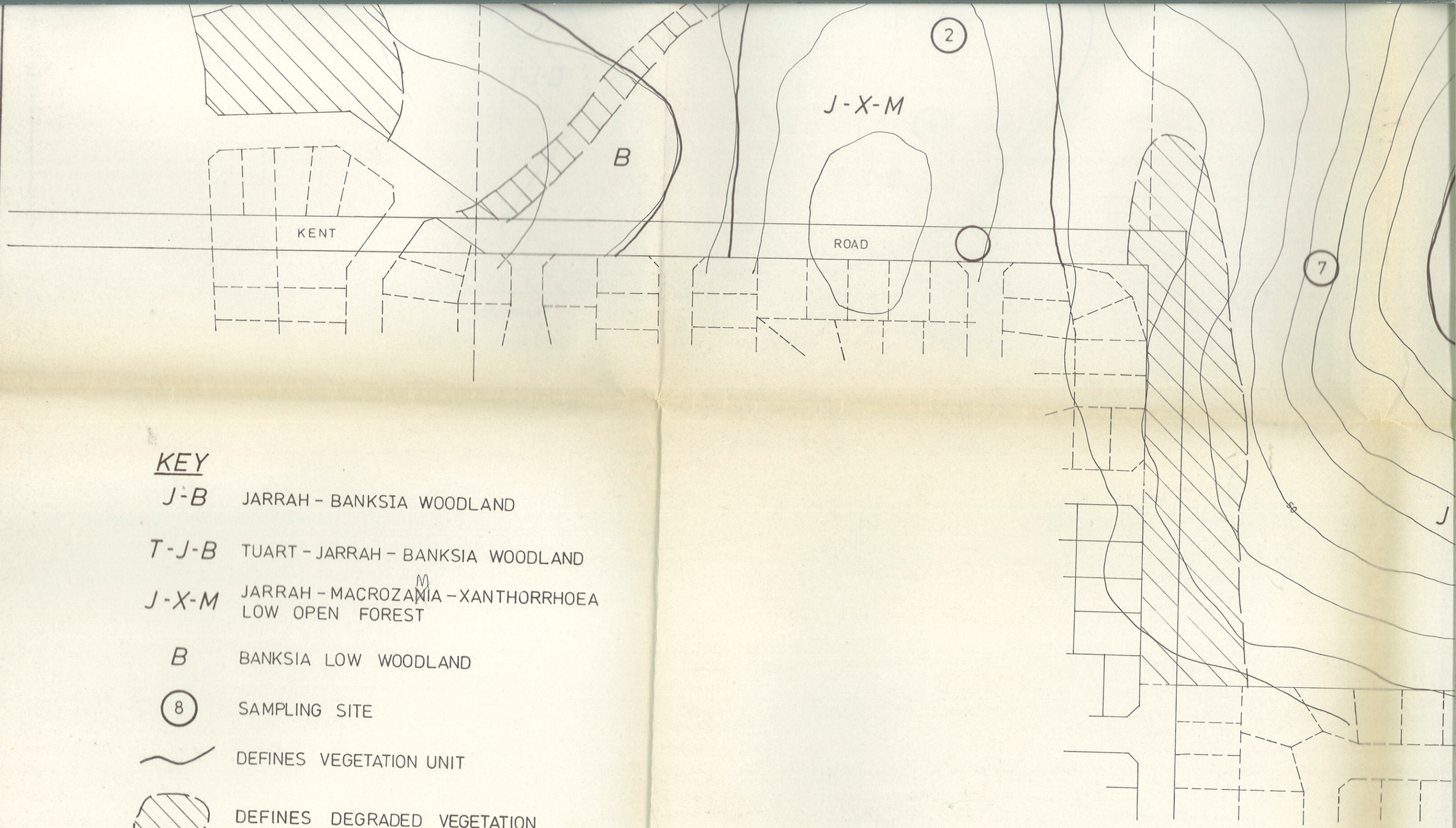


SCALE 1:2000

MARANGAROO RESERVE

VEGETATION SURVEY prepared by W.G. MARTINICK and ASSOCIATES

OCTOBER 1983



KEY

J-B	JARRAH - BANKSIA WOODLAND
T-J-B	TUART - JARRAH - BANKSIA WOODLAND
J-X-M	JARRAH - MACROZAMIA - XANTHORRHOEA LOW OPEN FOREST
B	BANKSIA LOW WOODLAND
(8)	SAMPLING SITE
~	DEFINES VEGETATION UNIT
▨	DEFINES DEGRADED VEGETATION

SCALE 1:2000

MA

VEGE

W. G.

PROPOSED HEPBURN AVENUE

NAPIER ROAD

STREET

J-B

T-J-B

J-M-X

J-B

B

18

7

5

8

9

10

3

12

16

1

2

58

59

57

56

54

55

53

52

51

50

PROPOSED HEPBURN AVENUE

NAPIER ROAD

WROTHAM STREET

19

T-J-B

J-B

18

T-J-B

7

J-B

8

10

J-M-X

3

1

2

J-M-X

J-B

T-J-B

B

B

DRIVE

3

12

16

15

17

11

1

2

53

52

51

50

49


DRIVE
AYLESFORD
T-J-B
J-M-X
J-M-X
J-B
B
17
3
4
11
1
2
59
58
57
56
55
54
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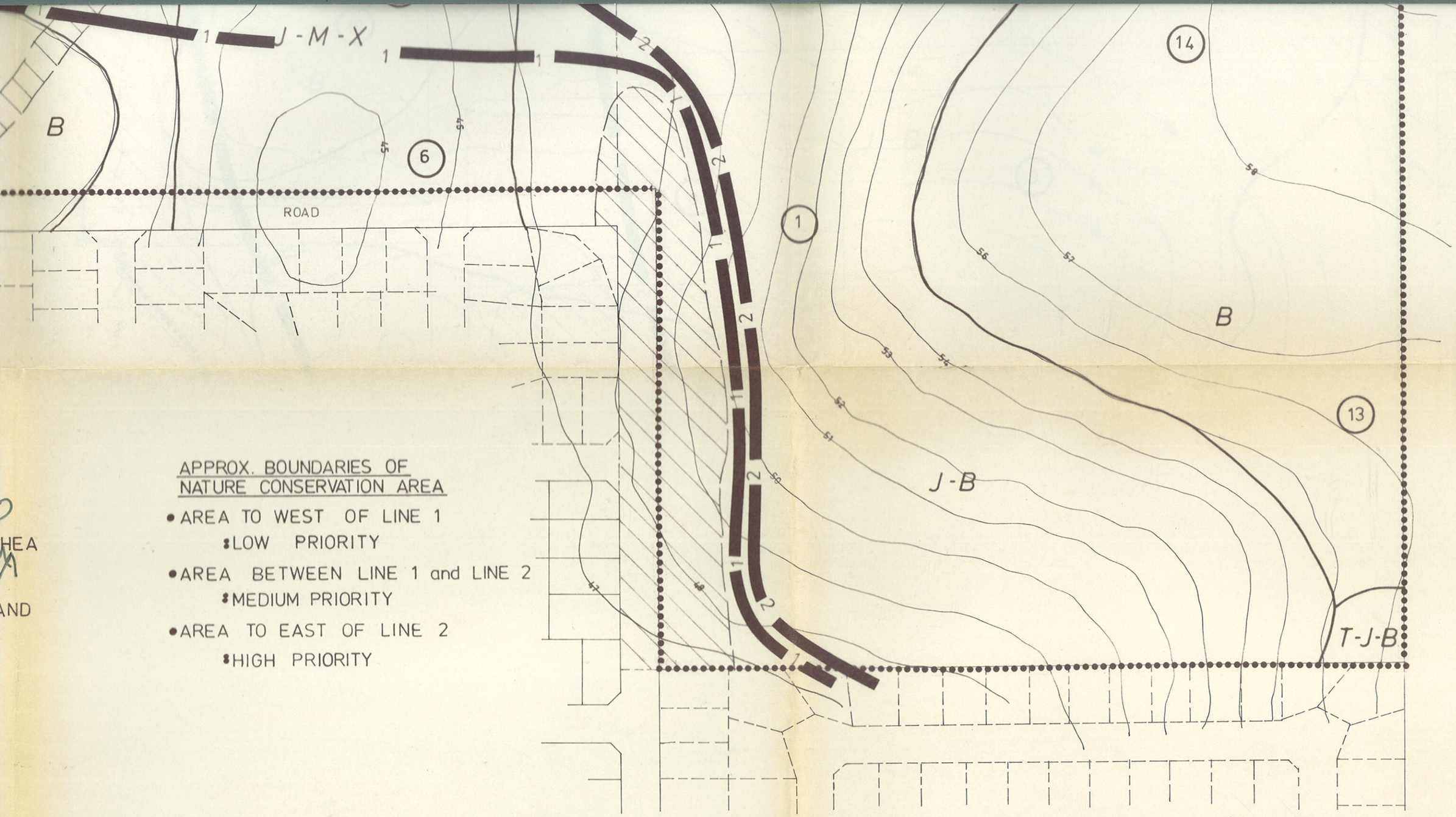
46
45



APPROX. BOUNDARIES OF NATURE CONSERVATION AREA

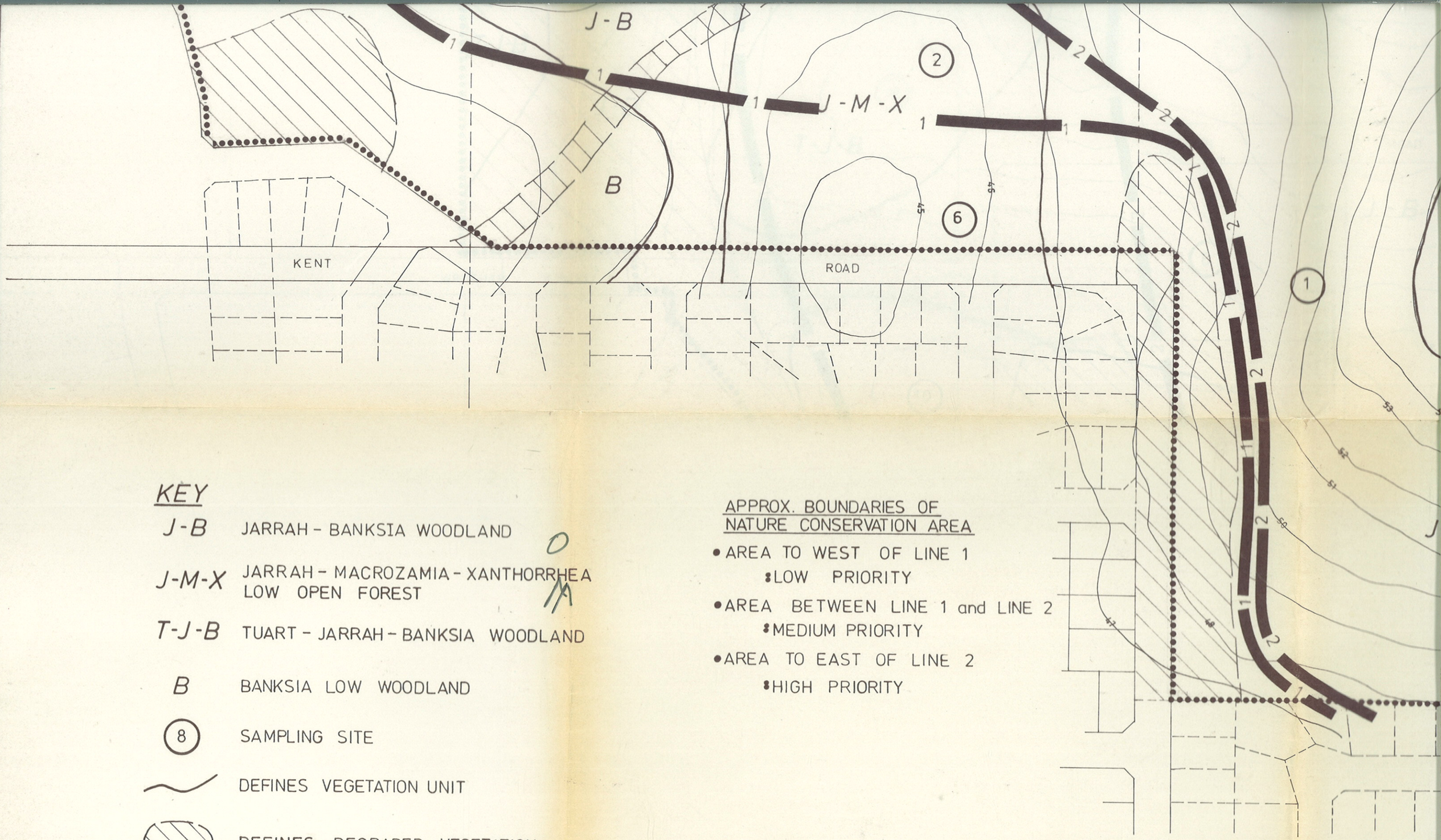
- AREA TO WEST OF LINE 1
  : LOW PRIORITY
- AREA BETWEEN LINE 1 and LINE 2
  : MEDIUM PRIORITY
- AREA TO EAST OF LINE 2
  : HIGH PRIORITY

SCALE 1:2000

MARANGAROO RESERVE

VEGETATION SURVEY prepared by W.G. MARTINICK and ASSOCIATES

OCTOBER 1983



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J-B	JARRAH - BANKSIA WOODLAND
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B	BANKSIA LOW WOODLAND
(8)	SAMPLING SITE
~	DEFINES VEGETATION UNIT
⊘	DEFINES DEGRADED VEGETATION
.....	RESERVE BOUNDARY
1	CONSERVATION BOUNDARY LINE 1
2	CONSERVATION BOUNDARY LINE 2

APPROX. BOUNDARIES OF NATURE CONSERVATION AREA

- AREA TO WEST OF LINE 1
  : LOW PRIORITY
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  : HIGH PRIORITY

MA

VEG
W.G

SITE NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Table 1

ASSOCIATED SPECIES

ACACIA huegelii	+				+														
ACACIA STENOPTERA	+	+										+							
DASYPOGON bromeliifolius										+	+								
PHEBALIUM CILIATA		+	+	+	+		+					+							
LEPIDOSPERMA tenue.	+	+				+	+												

IDENTIFYING SPECIES

DAVIESIA NUDIFLORA	D	D	D		D		D	D	+	D		+	+	+	+	+			
DAVIESIA DIVARICATA	D	D	D	+	D	D	D	D	+	D		+	+		D	D			
GONIOLOBIUM TOMENTOSUM	+	+	+	+	+	+				+	+	+			+				
HAKEA PROSTRATA	+	+	+		+		+									+	+		
HYPOLAENA EXSULCA	+	+	+		+		+	+	+	+	+			+	+	+			
LEUCOPOGON PROPINQUUS		+	+		+			+											
MACROZAMIA RIEDLEI	+	+	D	D	D	D		D	+	D		+				+	D		
THYSANOTUS PATERSONII	+	+			+						+								
XANTHORRHOEA PREISSII	D	D	D	D	D	+	+	D	+	D		+	D	+		+	D		
HAEMODORUM PANICULATUM	+	+	+		+	+	+		+		+	+					+		
HIBBERTIA HYPERICOIDES	+	+		+	+	+			+	+	+					D	D	+	
ACACIA SALIGNA																+		+	
PELARGONIUM CAPITATUM																+	+		
PHYLLANTHUS CALYCINUS											+					+	+		
EUCALYPTUS GOMPHOCEPHALA												+				+	+	+	
ANIGOZANTHOS																			
ANIGOZANTHUS humilis	+					+				+			+	+	+				
LYGINIA BARBATA								+						+	+	+			
SYNAPHEA POLYMORPHA					+										+				
ALLOCASUARINA HUMILIS															+				
CONOSPERMUM STOECHADIS															+				
CALYTRIX FLAVESCENS																+			
JACKSONIA FLORIBUNDA																+			
HAKEA RUSCIFOLIA																+			

IDENTIFYING SPECIES OF HIGHER VEGETATION UNITS

BANKSIA ATTENUATA	+	+	+		+	+	D	+	+	+	D	+	D	D	D	D	+	+	+
BANKSIA MENZIESII	+			+	+		+	+	+	+	+			+	+			+	
BANKSIA GRANDIS	+	+	+	+	+		+	+		+	+		+	+			+	+	+
EUCALYPTUS MARGINATA	D	D	D	D	D	D	D	+	+	D	+	+	+	+	+		+	+	+
ALLOCASUARINA FRASERIANA		+			+	+		+	+				+					+	+
BURCHARDIA UMBELLATA	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	
BOSSIAEA EREMOCARPA	+	+	+	+	+	+	+		+	+	+	+	+	+	+		+	+	
CONOSTYLIS AUREA		+	+	+	+	+		+	+		+	+	+	+	+		+	+	+
CONOSTEPHIUM PENDULUM	+	+				+			+	+	+	+	+				+		
DAVIESIA JUNCEA	+	+	+		+	+		+	+	+	+		+			+			
STIRLINGIA LATIFOLIA	+	+		+	+	+	+	+	+		+	+	+	+	+		+		
SOWERBAEA LAXIFLORA	+	+	+	+	+	+	+	+			+		+	+	+		+	+	+
PETROPHILE LINEARIS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
KENNEDIA PROSTRATA		+	+	+	+	+	+	+		+			+				+		+
HARDENBERGIA COMPTONIANA		+			+	+		+	+		+		+	+			D	+	+
TETRATHECA OCTANDRA	+	+	+	+	+	+	+	+		+	+		+				+	+	+

Tabl. 2

~~Occasionally distributed perennial shrubs and sub-shrubs~~

~~TABLE II (a)~~ A. Perennial shrubs and sub-shrubs.

ADENANTHOS CYGNORUM
ANIGOZANTHOS MANGLESII

ALLOCASUARINA HUMILIS ✓

ACACIA cochleans ✓

ACACIA PULCHELLA ✓

ASTROLOMA PALLIDUM ✓
BANKSIA ILICIFOLIA ✓
Calectasia cyanea
CONOSTYLIS aculeata.
CONOSTYLIS setigera
DAMPIERA LINEARIS
← DIANELLA REVOLUTA
DRYANDRA nivea ✓
ERIOSTEMON SPICATUS ✓
Eremaea PAUCIFLORA
GREVILLEA VESTITA. ✓
HAKEA LISSOCARPA ✓
← H. RUSCIFOLIA ✓
Hibbertia huegellii ✓
HYBANTHUS CALYCINUS
← HYPOCALYMMA robustum.
ISOTROPIS CUNEIFOLIA ✓
JACKSONIA FURCELLATA ✓
JACKSONIA sternbergiana ✓
JACKSONIA FLORIBUNDA ✓
LEPTOCARPUS SCARIOSUS ✓
LEPIDOSPERMA ANGUSTATUM. ✓
LOXOCARYA FLEXUOSA ✓
LOMANDRA PREISSII ✓
LOMANDRA ENDLICHERI. ✓
← OXYLOBIUM CAPITATUM ✓
PETROPHILE SQUAMATA. ✓
PERSOONIA SACCATA. ✓
PIMELIA SULPHUREA.
PATERSONIA OCCIDENTALIS.
PTILOTUS MANGLESII ✓
← RICINOCARPUS glaucus
Scaevola PALUDOSA.
Schoenus CURVIFOLIUS ✓
THYSANOTUS DICHOTOMUS

~~Table 1~~ 1'

B. ~~Cassula~~ ANNUALLY regenerating species

AMPHIPOGON AMPHIPOGONOIDES

Calandrinia CALYPTRATA

Calandrinia LINIFLORA

Crassula colorata

~~Cassula~~

Caesia parviflora ✓

Daucus glochidiatus

Dichopogon strictus

Drosera menziesii

Drosera pallida

Eryngium pinnatifidum

Juncus bufonius

Lagenifera huegelii

Podolepis gracilis

Podolepis ? georgei

Quinetia urvillei

TRACHYMENE PILOSA

~~orchids~~

C. Orchids:

Caladenia flava

Caladenia patersonii var longiclavata (B)

ELYTHRANTHERA EMARGINATA

E. brunonis

DIURIS LONGIFOLIA

LYPERANTHUS NIGRANS.

MICROTIS ALBA.

Table 2. ~~Occasionally distributed~~

Occasionally distributed native species

Table 3

TABLE IV LIST OF EXOTIC PLANT SPECIES.

N = SPECIES NATURALISED IN UNDEGRADED WOODLAND

D = SPECIES RESTRICTED TO DISTURBED AND DEGRADED AREAS.

ASPHODELLUS FISTULOSIS D
AVENA BARBATA D
A. FATUA D
ANAGALLIS ARVENSIS D
ARCTOTHECA CALENDULA D
BRIZA MAXIMA (N)
B. MINOR (N)
CERASTRIUM # GLOMERATUM. (N)
CARPOBROTUS SP. D
DISCHISMA CAPITATUM (N)
EHRHARTA CALYCINA D
E. LONGIFOLIA D
ERODIUM BOTRYS D
ERODIUM CICUTARIUM (N)
EUPHORBIA PEPLUS (N)
GERANIUM MOLLE (N)
HEDYPNOIS RHAGADIOLOIDES D
HOMERIA COLLINA D
HORDEUM : LEPORINUM. D
HYPOCHOERIS RADICATA (N)
← INULA (GRAVEOLENS / GRAVEOLENS) D
LAGURUS OVATUS D
LACHENALIA REFLEXA (N)
LUPINUS SP. D
OXALIS PES-CAPRE { PETRORHAGIA PROLIFERA - (N) / RAPHANUS RAPHANISTRUM D
SOLANUM NIGRUM D
SONCHUS OLERACEOUS. D
STENOTAPHRUM SECUNDATUM. D
TRIFOLIUM CAMPESTRE (N)
URSINIA ANTHEMOIDES (N)
VULPIA MYUROS. (N)

Table 3. Exotic species. N = naturalized species.
D = species restricted to disturbed areas.


ROBERTS