

WESTERN AUSTRALIAN NATURE RESERVE MANAGEMENT PLAN NO. 8
(DRAFT)

NATURE RESERVES OF THE
SHIRE OF WYALKATCHEM

BY

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PREFACE

This draft plan is part of the "Western Australian Nature Reserve Management Plan" series, in which plans are published for reserves or groups of reserves. Completion of each plan involves three stages. First, the plan is published as a draft, and members of the local community - particularly reserve neighbours, plus government departments, tertiary institutions, conservation groups and the general public - are encouraged to submit comments. The draft is then reviewed in the light of these comments, and an amended draft and an audit of public submissions are produced. This is the second stage, with the published submissions and amended draft being submitted to the Western Australian Wildlife Authority (WAWA), the Minister for Fisheries and Wildlife and the Bush Fires Board for approval. Once this approval has been obtained the third stage follows with the plan being published in its final form. As such it constitutes a 10 year working plan in terms of Section 12D of the Wildlife Conservation Act (1950, as amended) and Section 34(1) of the Bush Fires Act (1954, as amended).

Thus the planning process for Western Australian nature reserves encourages public comment and allows for full consultation with the public.

The purpose of this plan is to detail management programs for seven nature reserves in the Shire of Wyalkatchem. Although this plan covers only half of the total number of nature reserves within the Shire (the remainder being either considered for, or in the process of gazettal), these seven reserves contain representative samples of most of the vegetation types found in the Wyalkatchem area. Also, the management strategies advocated in this management plan could well be extended to deal with similar problems encountered on other reserves in the area. This plan follows the pattern established in Crook (1981) and Crook *et al.* (1982) of treating as a group nature reserves in particular local authority districts. This approach provides a regional setting, allowing the development of complementary management prescriptions. Also, a Shire plan is immediately applicable to the broader task of land-use planning, which is a primary function of local and state government in Western Australia, and is based on local government in country areas. Recognition of this application of management plans helps further the dual principle that nature reserves are part of the total environment and that nature conservation is a matter of interest to the whole community.

Although this plan follows an earlier established pattern, it is the first to deal with the management of jointly vested reserves - in this case WAWA and the Shire of Wyalkatchem hold joint vesting orders for four of the seven reserves. These joint orders have formalised the need for close liaison between WAWA and the local authority regarding the determination and implementation of management objectives and strategies for the areas concerned.

The concept of joint vesting is based on the following five conditions, which WAWA formulated on 25 May 1981, and with which the Department of Lands and Surveys and the Shire of Wyalkatchem subsequently agreed.

1. The vesting orders include a condition that powers conferred under Section 5(1)(e) of the Parks and Reserves Act (to grant licences to graze stock on reserves) and 5(1)(f) (to quarry reserves for soil, gravel, etc.) may not be applied on the reserves.
2. The reserves be for the single purpose - Conservation of Flora and Fauna.
3. Management of the reserves be agreed upon through the established process of management planning. Provision for recreation and other public use would be included in the plan.
4. The Wyalkatchem Shire nominate a person, preferably a salaried officer, to be an Honourary Wildlife Officer and part time "caretaker".
5. The arrangement be regarded as an experiment in co-operative management of nature reserves.

In all plans in this series vegetation is described according to Muir (1977). This classification system uses structural vegetation categories that are based on life form, height and canopy cover (App. 1). The life forms and height classes range from "trees >30 m" to "mosses, liverwort", with intermediate forms including mallees, shrubs, mat plants, bunch grasses and sedges. Canopy cover is divided into four categories: dense; mid-dense; sparse; very sparse. An example of this system applied in the Wyalkatchem area is York Gum Open Low Woodland A over Acacia Scrub over Saltbush Dwarf Scrub D.

The scientific and common names used for mammals, reptiles and frogs throughout the text are according to the W.A. Museum. Birds are named according to Condon (1975).

This draft plan is in nine parts:

Part 1 summarises the biophysical attributes of the Shire of Wyalkatchem, and of the seven nature reserves in this administrative area.

Parts 2 - 8 discuss the individual nature reserves. Each part is split into two sections: "A. The Reserve", and "B. Plan for Management". Section A expands upon the biophysical attributes of the nature reserve, as well as outlining its historical and nature conservation values. Section B details management objectives and the strategies necessary to achieve these objectives.

Part 9 contains general considerations and conclusions. An important facet of this final section is a consideration of complementary management for the Wyalkatchem group, or system, of nature reserves.

PART 1 : INTRODUCTION - THE SHIRE OF WYALKATCHEM

The Shire of Wyalkatchem, 170 km north-east of Perth (Fig. 1), lies in the heart of the Western Australian wheatbelt. It also occupies a central position in the large sandplain extending from Toodyay and Kellerberrin in the south to Wongan Hills and Bencubbin in the north. The Shire has an area of 1 307 km² and supports a resident population of 940 people (Australian Bureau of Statistics, 1981-82). This plan covers seven nature reserves in the Shire, four of which are vested jointly in WAWA and the Shire of Wyalkatchem and the remaining three solely in WAWA. Between them they support samples, though sometimes quite small, of much of the habitat characteristic of the region.

The Wyalkatchem area was not settled until late in the nineteenth century, although John Septimus Roe had traversed the area as early as 1836. Initially, most of the area was held under pastoral lease, with graziers and squatters running sheep on the lower-lying woodland and salt-lake country where native grasses provided fodder, rather than on the heath-dominated sandplains where grasses were almost non-existent. Such pastoral occupation began in the 1860s and was followed by closer settlement in freehold agricultural holdings after the completion of the Northam-Southern Cross railway in 1894. Most of the area was taken up in the ensuing 30 years.

Nature reserves in one form or another existed from the earliest days of settlement. Three of the current system were set aside for conservation over 80 years ago, and one of these has been gazetted as a Crown reserve for the last 100 years. Thus, conservation (nature) reserves were, and continue to be, an integral part of the Shire environment.

1. CLIMATE

The Wyalkatchem Shire has a typical wheatbelt climate, with hot dry summers and mild wet winters. Most of the rain is received in winter from May to August, and is generally very reliable. In late summer and early autumn there is occasionally rain from thunderstorms, but this is rarely substantial in amount. A mean temperature for the coldest month of 11°C is indicative of the mildness of winter, with hot summers being characterised by mean temperatures in excess of 25°C and absolute maximum above 40°C (Beard, 1980: data collected in Kellerberrin, about 60 km south-south-east of Wyalkatchem, Bureau of Meteorology, 1975).

The Shire lies between the 350 and 300 mm isohyets with a gradual decrease from west to east, with declining coastal influences (Fig. 1). Thus, the Shire clearly falls within one climatic zone (as defined by Bagnovis and Gausson, 1957). This is a zone characterised by seven to eight "dry" months, in which potential evapo-transpiration exceeds precipitation, and is classified as Dry Warm Mediterranean: a typical wheatbelt climate.

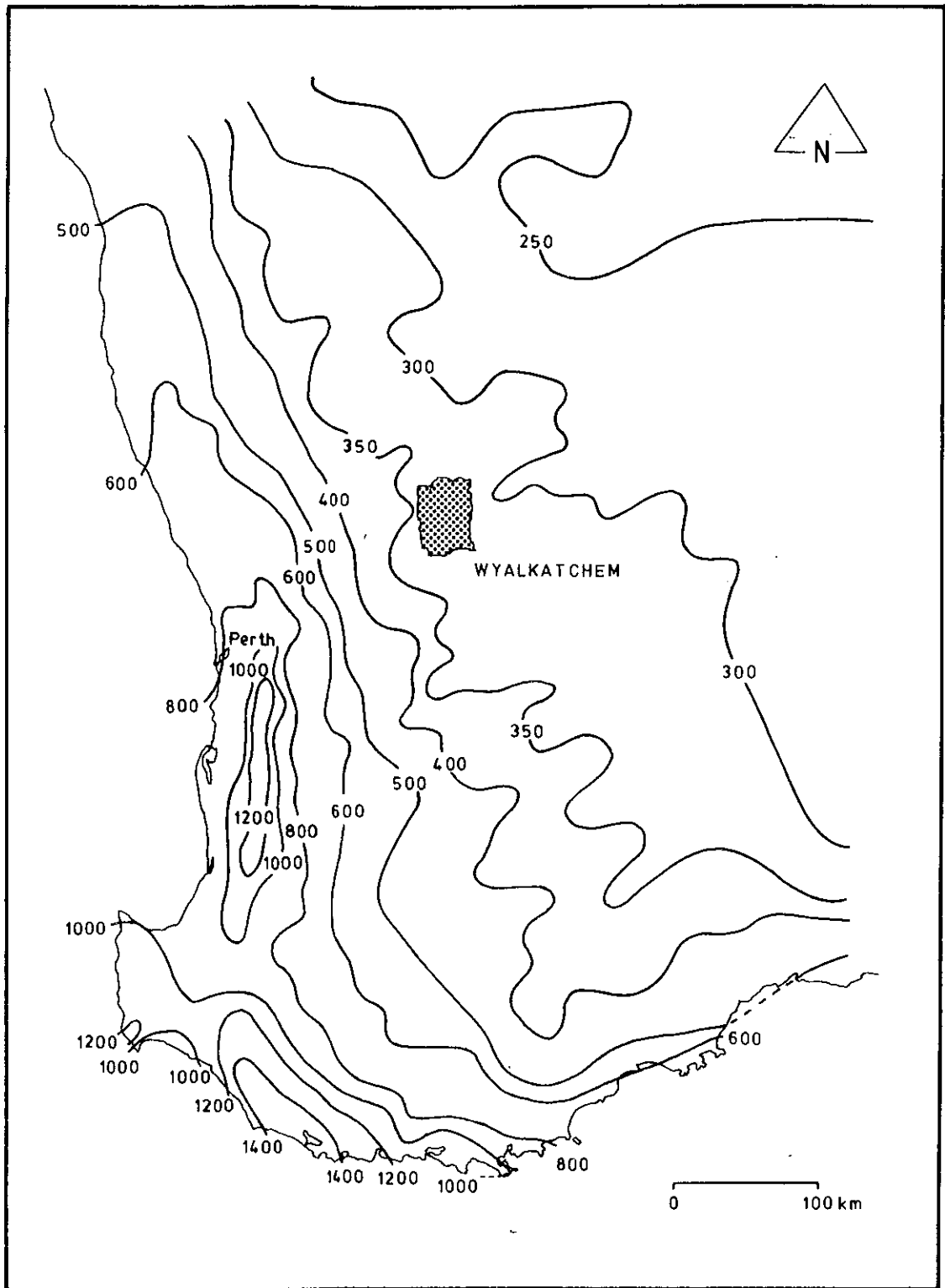


Figure 1. Location of the Shire of Wyalkatchem, and its relationship to annual isohyets (mm). (Source: Lands and Surveys, 1984 and Bureau of Meteorology, 1984.)

2. GEOMORPHOLOGY

Geomorphic differences, in association with changing soil types, are responsible for most of the habitat variation within the Shire. The following description of the geology of the area introduces the geomorphology. The Wyalkatchem area is part of the Yilgarn block, an ancient rigid "shield" area composed mainly of Archaean granite and gneiss with some altered volcanics and sediments. Thus, the whole of Wyalkatchem Shire is underlain by this granitic shield, with alluvia covering the major valleys.

The landforms within the Shire are a product of the long geologic history of the area. Over the millions of years since the Yilgarn block was first formed, it has been levelled by glaciation and traversed by slow-flowing rivers. The country rock has been deeply weathered and covered by a thick layer of kaolinised material (the "pallid zone"), which in turn is capped either by soil or massive laterite, ironstone gravels and sand. Surface outcrops of massive granite were resistant to these processes. When the climate became drier and more seasonal, rivers degenerated to chains of salt lakes, and although weathering continued there was no removal of the resultant products. Hence valleys have been gradually filling up, as rivers no longer flow through the area.

As a result, today's landscape is gently undulating and of low relief; the only exception is occasional granite outcrops, which protrude as rock domes or tors. Granite outcrops form a large part of the area of both Elashgin and Carribin Nature Reserves. At the other end of the landform sequence, strings of salt lakes follow ancient river valleys. Derdibin and Wallambin Nature Reserves capture some of the characteristics of this part of the landscape. In the intervening areas sandplains and upper drainage lines share dominance. Nature reserves such as Wyalkatchem and Nembudding contain features of both.

3. SOILS

Soils are the other major factor influencing vegetation distributions in the Wyalkatchem area, with this factor being strongly influenced by position in the landscape.

On the high ground sandplains occur: gently sloping to gently undulating plateau areas with long and very gentle slopes, and in places abrupt erosional scarps. These slopes may be either erosional or depositional in origin. The erosional slopes and ridges are typified by ironstone gravels, or sands containing ironstone gravels, underlain by a hard mottled zone. On depositional slopes the soils are sandy yellow earths, containing some ironstone gravel, and yellow earthy sands, often with ironstone gravels. Locally granite outcrops, often substantial in area, are surrounded by shallow stony and gritty sandy soils.

Below the sandplains on the upper drainage lines, hard yellow mottled and hard red soils, both alkaline, are characteristic. In the valley bottoms the mottling disappears and acidic lateritic clays occur below 60 to 120 cm (Beard, 1980). Salt-lake systems with saline loams occupy the lowest parts of the major valleys and drainage lines.

4. VEGETATION

The following comment provides a good introduction to the vegetation of the area:

"Soil and vegetation types merge into one another, mallee and thickets are usually mingled and the woodland occurs mixed with mallee, and as patches in mallee and thicket."

(Beard 1980, after traversing the Bencubbin district, immediately to the north of Wyalkatchem).

This description holds true for the Wyalkatchem district, where one of the marked features of the vegetation is its mosaic character.

The vegetation of the region has been mapped at a broad scale (1:250 000) by Beard (1980), who distinguished 10 vegetation associations within the Shire (Fig. 2).

These can be divided into three broad groups, moving from higher to lower in the landscape.

Sandplains

1. Thickets of *Acacia-Allocasuarina-Melaleuca* on sandplain.
2. Sandplain thicket and heath (incorporates undifferentiated kwongan communities and *Allocasuarina campestris* communities).
3. Thickets of *Allocasuarina campestris*.
4. Undifferentiated kwongan communities.

Upper and middle drainage lines

5. Eucalypt woodlands of York Gum, Wandoo, Morrell, Salmon Gum and Gimlet.
6. York and Salmon Gum woodland.
7. Salmon Gum and Gimlet woodland.

Lower drainage lines

8. York Gum, Salmon Gum and Gimlet.

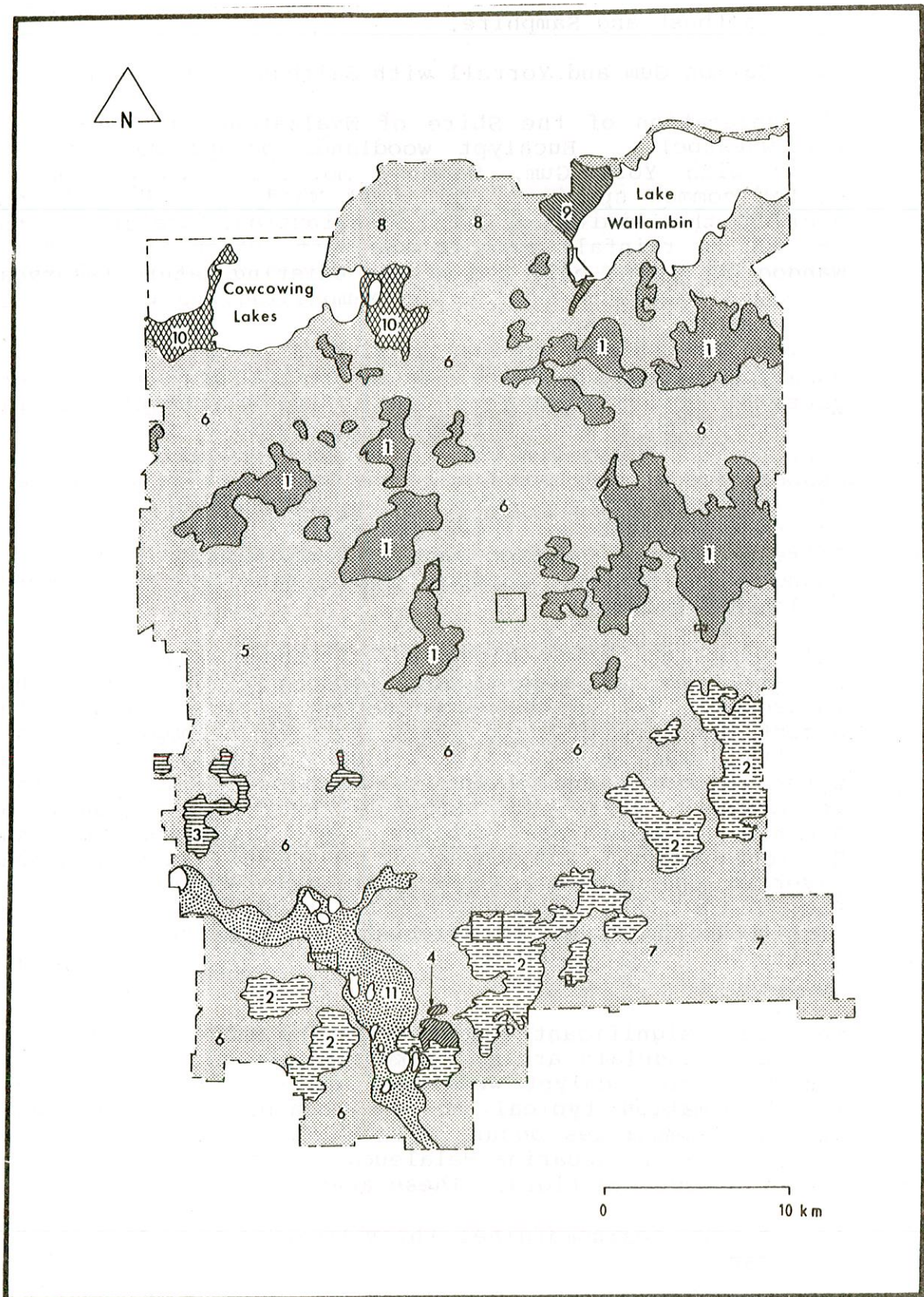


Figure 2. Vegetation of the Shire of Wyalkatchem (Source: Beard, 1980). Numbered associations are described in the accompanying text.

9. Saltbush and Samphire.

10. Salmon Gum and Yorrell with Saltbush and Samphire.

The vegetation of the Shire of Wyalkatchem is typical of the wheatbelt. Eucalypt woodlands occupy much of the Shire with York Gum, Wandoo, Morrell, Salmon Gum and Gimlet common species. Of these Wandoo is the only one nearing the limits of its distribution, preferring the 380-890 mm rainfall zone to the west (Chippendale, 1973). Wandoo occurs on only two of the existing nature reserves, in mixed eucalypt woodland on Nembudding and Wyalkatchem.

Salmon Gum shares dominance with a range of different eucalypts across the Shire. In the central and south-western parts it occurs with York Gum - the only nature reserve containing this once extensive association is Wallambin; here it is very limited in extent. Gimlet occurs in association with Salmon Gum in the central and south-western parts of the Shire. Korrelocking Nature Reserve contains spectacular stands of these two species. In the centre of Shire on nature reserves such as Nembudding, Salmon Gum is found with Gimlet, Wandoo, Black Marlock, Red-flowered Mallee and Redwood.

Salt country, lying along old drainage lines or river systems, is a significant part of the Wyalkatchem landscape. Two of the seven nature reserves are composed almost entirely of salt lakes and the accompanying salt country. The lakes have bare floors, usually filling with water in winter and drying to a surface of salt crystals in summer. These are surrounded by peripheral bands of Samphire (Halosarcia bidens, H. halocnemoides and H. lepidosperma) and these by shrublands with a ground layer of succulents. These grade into woodlands of York Gum, Yorrell and Salmon Gum, or York Gum and Salmon Gum, with a ground layer of Saltbush (Atriplex vesicaria), or scattered Wait-a-while (Acacia colletioides) and succulents.

The other significant community in the Shire, found on the residual sandplain areas, is kwongan (Beard, 1980). This, similarly to eucalypt woodlands and salt lake complexes, is a formation typical of the wheatbelt. Three basic kwongan communities occur, all of which belong broadly to an Acacia-Allocasuarina-Melaleuca alliance and share a common associated flora. These are:

1. Acacia resinomarginea thickets on deep yellow earthy sand.
2. Mixed kwongan association on yellow sandy soils containing ironstone gravel. Acacia, Allocasuarina or more rarely Melaleuca species are dominant.
3. Broom Bush (Melaleuca uncinata) thickets on shallow or loamy sands with impeded drainage.

All seven nature reserves carry at least a small area of kwongan, the commonest being the mixed kwongan association on yellow sandy soils. Both Wallambin and Derdibin, the two salt-lake reserves, plus Korrellocking, support Broom Bush scrub/thicket in areas of impeded drainage. Elashgin and Wyalkatchem Nature Reserves support mixed thickets of Broom Bush and Allocasuarina campestris, an association typical of the shallow soils associated with granite outcrops. Carribin, to the south-east of Elashgin, supports a pure A. campestris thicket with a mixed thicket of this species, A. acutivalvis and Leptospermum erubescens occurring around the soak. Further north, in the centre of Shire, on Wyalkatchem Nature Reserve, a mixed scrub of the two Allocasuarina species, plus Leptospermum erubescens, One-sided Bottlebrush (Calothamnus quadrifidus) and Broad-seeded Hakea (Hakea platysperma) occurs, as well as thickets of each of the Allocasuarina species. To the east, on Nembudding, an A. acutivalvis thicket occurs. Obviously kwongan occurs as a mosaic of different associations, with varying dominants, throughout the Shire. These differences reflect, on a small scale, the large scale variations and complexities of kwongan communities throughout the wheatbelt.

From the above brief introduction it is aparent that Wyalkatchem Shire includes a good sample of the wheatbelt landscape and its associated flora. Similarly the existing seven nature reserves incorporate representative samples of most of this landscape. As such these reserves are of high biological value, both individually and as a group.

5. FAUNA

Little is known about the fauna of the Shire of Wyalkatchem. Brief surveys of the seven nature reserves indicate that Western Grey Kangaroos, Euros, Echidnas, foxes and rabbits are part of the resident fauna. Further surveys, particularly those based on trapping, would reveal a greater wealth of fauna, particularly reptiles. On Durokoppin and Kodj Kodjin Nature Reserves (No.s A22921 and 23138 respectively) in Kellerberrin Shire (immediately south-east of Wyalkatchem) 10 species of native mammal have been recorded, plus 31 reptile and 2 frog species. It is likely that similar numbers occur in the Wyalkatchem area.

Brief surveys of the birds on the Wyalkatchem nature reserves have recorded 77 species. Further surveys should reveal the presence of at least 50 more species, many of them waterfowl which would seasonally use the extensive salt-lake systems.

6. LAND USE

The Wyalkatchem area was not settled until relatively late in the State's history of development. Pastoral

occupation began in the mid to late nineteenth century, with closer settlement in freehold agricultural holdings following the completion of the Northam-Southern Cross railway line in 1894, and completion of the Dowerin-Merredin loop-line in 1911. Most of the land within the Shire was taken up in the decades 1894 to 1924. At first only the woodland soils were cleared and used for agriculture. However, as the clearing and fertility problems of the sandplain areas were resolved they too were utilised for cropping.

The decline in population in the Wyalkatchem area from the first days of agricultural settlement (1890s) is a reflection of continuing changes in land use. Round the turn of the century Wyalkatchem was producing butter, bacon, salted pork, poultry and eggs for the newly opened areas further east along the railway line. It was during this time that the population reached its peak. In the ensuing years refrigerated transport and competition from Kellerberrin and Perth made continued intensive agriculture uneconomic. Hence extensive agriculture, such as stock and grain production, followed and the population declined. Increased mechanisation and uncertain fluctuating markets led to further population declines.

Today over half the area of rural establishments in the Shire is devoted to crops (about 74 000 ha in 1981-82: Australian Bureau of Statistics). Wheat is the main grain, with oats and barley being of less importance. Sheep are the other major rural product. Sheep numbers in the Shire have steadily increased over the years - from 95 537 in 1940-41 to 131 333 in 1981-82 (Australian Bureau of Statistics). The acreage of wheat, on the other hand, has fluctuated considerably, from 104 098 acres (42 160 ha) in 1930-31, to 77 011 (31 190 ha) in 1950-51, to 48 599 ha in 1975-76, to 65 593 ha in 1981-82 (Australian Bureau of Statistics).

Private holdings, which are predominantly rural, contribute 88.5% to the area of the Shire. Of the remainder, 9.5% is Crown reserve, 1.6% vacant Crown land and 0.4% leasehold. Within the Shire nature reserves contribute 5.8% to the total area of Crown reserves (including road and railway reserves). This means that presently nature reserves occupy 0.6% of the Shire's total area (June 1984).

7. THE RESERVES

The seven nature reserves briefly introduced below form the group, or system, of nature reserves considered under this plan for management (Table 1, Fig. 3). Four of the seven are jointly vested in WAWA and Wyalkatchem Shire, and the remaining three in WAWA.

In this plan the reserves have been ordered according to their general position in the landscape, moving from lower to higher - from the salt lakes, through the eucalypt

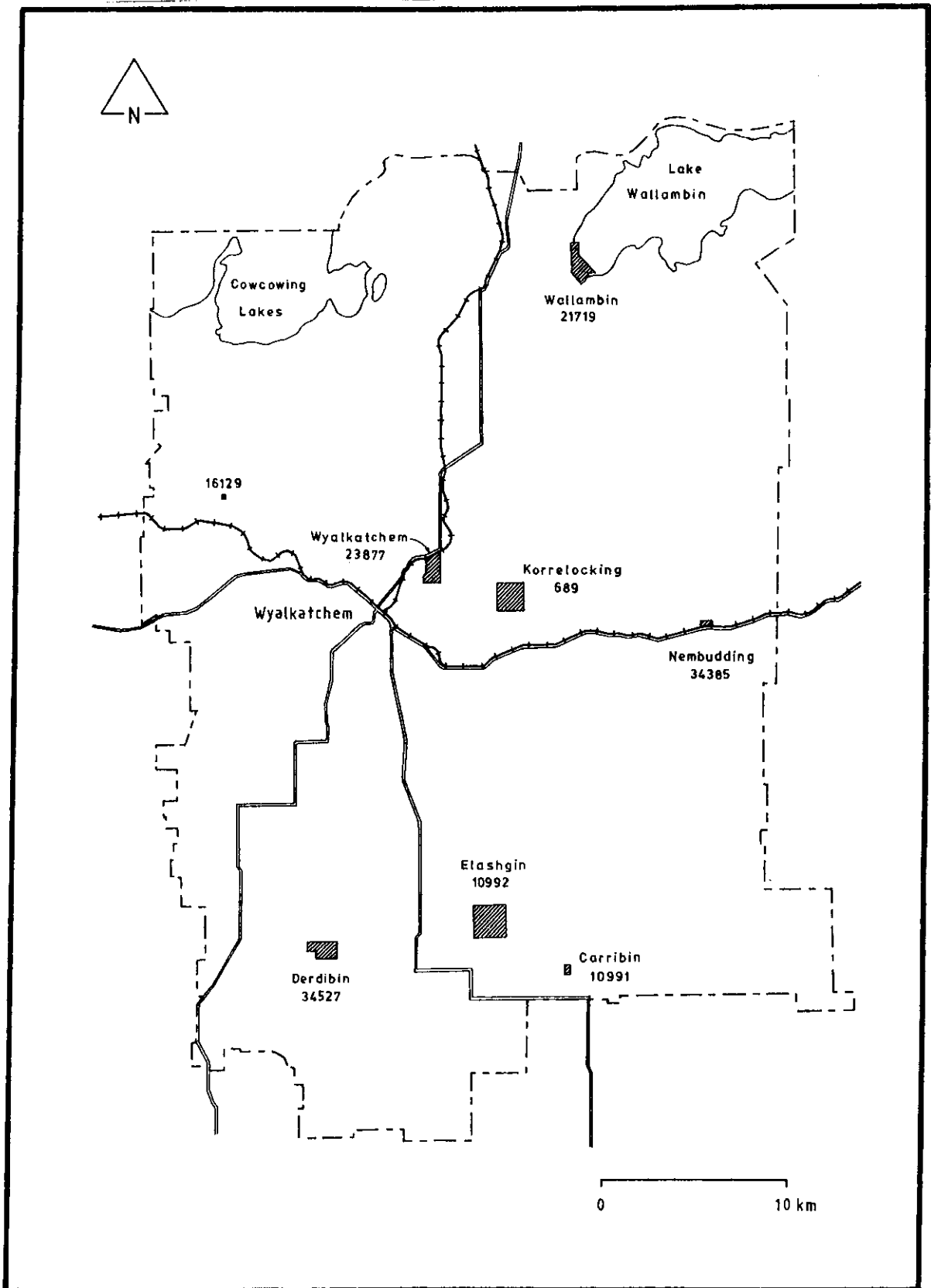


Figure 3. Shire of Wyalkatchem showing location of nature reserves vested in WAWA (June 1984). (Source: Lands and Surveys 1:50 000 series.)

woodlands, to the sandplains and granite outcrops.

TABLE 1 : THE NATURE RESERVES OF THE SHIRE OF WYALKATCHEM

RESERVE NUMBER	RESERVE NAME	PURPOSE	AREA (HA)	VESTED AUTHORITY
34527	Derdibin	Conservation of Flora and Fauna	133.1	WAWA
21719	Wallambin	Conservation of Flora and Fauna	121.5	WAWA
689	Korrelocking	Conservation of Flora and Fauna	259.0	WAWA & LA
23877	Wyalkatchem	Conservation of Flora and Fauna	129.5	WAWA & LA
34385	Nembudding	Conservation of Flora and Fauna	14.2	WAWA & LA
10991	Carribin	Conservation of Flora and Fauna	22.7	WAWA
10992	Elashgin	Conservation of Flora and Fauna	259.0	WAWA & LA

WAWA - Western Australian Wildlife Authority
 LA - Local Authority

Derdibin Nature Reserve (No. 34527)

Derdibin Nature Reserve, about 500 m east of its namesake Derdibin Rock, is 17 km south of Wyalkatchem. The reserve is roughly rectangular, with an area of 133.1 ha and perimeter of approximately 5.3 km. De Pierres Road, the closest formed road, is 4.4 km to the south of the reserve.

The reserve is surrounded by privately owned land, except on the western corner where Derdibin Rock Water Reserve (No. 10849) abuts. The remainder of the land to the west has been cleared and is used for cropping, while to the east the land was cleared many years ago and has since regenerated. The land on the northern and southern boundaries, although uncleared, is used for grazing.

Derdibin Nature Reserve is part of an extensive chain of salt lakes that cut through the south-western corner of the Shire. This flat reserve is dominated by small seasonal salt lakes and associated Samphire flats. On higher ground Melaleuca and Acacia scrub occurs, with York Gum on the southern boundary. Soils are sandy clays

becoming more clayey in the lake beds.

Wallambin Nature Reserve (No. 21719)

Wallambin Nature Reserve is 21 km north-north-east of Wyalkatchem on the south-western margin of Lake Wallambin. Lackman Road passes along the western boundary of this irregularly shaped reserve which has an area of 121.5 ha and a perimeter of some 5 km.

The land to the west and south is privately owned, cleared and used for cropping. Lake Wallambin Public Utility Reserve (No. 19685) abuts the eastern boundary of the nature reserve. A small area of uncleared farmland used for grazing abuts the western half of the northern boundary.

The reserve is flat, with about a quarter of its area occupied by two seasonal salt lakes. The lakes are surrounded by Samphire flats, with the elevated lake margins dominated by Melaleucas. Salmon and York Gums appear on the higher ground along the western boundary. Soils throughout are loamy, becoming heavier on the Samphire flats and lake beds.

Korrelocking Nature Reserve (No. 689)

Korrelocking Nature Reserve is 7 km east of Wyalkatchem townsite and 4 km east of Wyalkatchem Nature Reserve. This square reserve has an area of 259.0 ha and a perimeter of about 6.5 km. Goldfields Road and a water pipeline follow the northern boundary, and Tyler Road cuts the reserve diagonally from the north-west to the south-east. The reserve lies in gently undulating country and is surrounded by cleared farmland, apart from a small area of grazed Jam woodland on the north-eastern corner.

Korrelocking is dominated by mature Salmon Gum and Gimlet woodland on sandy clays and loams. On the higher ground in the north-eastern corner granite outcrops and paving are surrounded by York Gum and Jam on red-brown loams. A dense Melaleuca thicket, surrounding a seasonal swamp, occurs on heavier soils in the south-western corner.

Nembudding Nature Reserve (No. 34385)

Nembudding Nature Reserve is 18 km east of Wyalkatchem on the Wyalkatchem-Trayning Road. It has an area of 14.2 ha and a perimeter of 1.8 km. Nembudding Bin Road follows the southern boundary, and North Road cuts through the western portion of the reserve. The reserve is rectangular, its longer axis running east-west. To the west it is bounded by a timber reserve (No. 24105), while the remaining sides abut cleared, privately owned agricultural land.

Nembudding Nature Reserve is gently undulating. Two distinct soil types occur - pale clay-loams with varying

proportions of sand, and clays with lateritic gravel. The former, covering 60% of the reserve area, supports eucalypt woodlands with species such as Salmon Gum, Gimlet and Wandoo present. The latter, covering the remaining 40%, carries Allocasuarina thicket.

Wyalkatchem Nature Reserve (No. 23877)

Wyalkatchem Nature Reserve, an irregularly shaped reserve with an area of 129.5 ha and a boundary length of about 5.3 km, is 3 km north-east of Wyalkatchem. Goldfields Road marks the southern boundary and the Perth-Koorda railway abuts the northern boundary. The reserve is bordered to the north, south and east by gently undulating cleared, privately owned farmland. A water supply reserve (No. 16623) and a golf course abut the western boundary.

Wyalkatchem Nature Reserve has a range of soil types, which support a diversity of vegetation. Loams and clay loams support mallee woodland; these become more clayey in texture beneath Wandoo woodland. Pale sands and sandy loams are characteristic of the variable species-rich heathland. Areas of yellowish sand and gravel support Allocasuarina-dominated tall dense thickets.

Carribin Nature Reserve (No. 10991)

Carribin Nature Reserve has an area of 22.7 ha and a perimeter of about 2 km, with the longer axis of this rectangular reserve lying north-south. The reserve is surrounded by cleared, privately owned farmland, and is not accessible by road. The nearest made road, Parsons Road, is 900 m west of the reserve.

The reserve is dominated by a large granite hillside, which occupies the northern half of the reserve. A well-defined soak on the southern lower edge of this rock formation is the source of a small seasonal water course that drains southwards.

The sandy loam soils of Carribin support a diversity of vegetation types, all of which have been affected by stock. Allocasuarina thicket and Jam woodland dominate the reserve, with York Gums appearing round the soak. Sandalwood and Granite Kunzea grow in cracks on the granite surfaces.

Elashgin Nature Reserve (No. 10992)

Elashgin Nature Reserve (259.0 ha) is square, with a perimeter of 12.5 km. Maitland and Tammin Road pass along the northern and western boundaries respectively. The reserve is surrounded by gently undulating, cleared, privately owned farmland.

The central and southern parts of the reserve are dominated by a series of granite outcrops which, although low in relief, are quite extensive in area. Elashgin

Soak, after which the reserve was named, is located in the southern-central part of the reserve.

The soils of Elashgin Nature Reserve are primarily loams and sandy loams, with extensive areas of outcropping granite. A diversity of vegetation types occur, the boundaries of which intergrade and are poorly defined. Allocasuarina and Melaleuca thicket, which occupy much of the area, grade into Jam woodland in the south. York Gum woodland and stands of Sheoak (Allocasuarina huegeliana) also appear in the southern half of the reserve. Similarly to Carrabin, Granite Kunzea grows in cracks in the granite outcrops.

PART 2 : DERDIBIN NATURE RESERVE (NO. 34527)

A. THE RESERVE

1. PHYSICAL CHARACTERISTICS AND RELATIONSHIPS

Derdibin Nature Reserve, about 500 m east of Derdibin Rock, is 17 km south of Wyalkatchem (Fig. 3) and 4.4 km north of the nearest made road. It is rectangular, with an area of 133.1 ha and a perimeter of about 5.3 km (Fig. 4).

The reserve is surrounded by privately owned land except on the western corner where Derdibin Rock Reserve (No. 10849 - set aside for Water) abuts. The remainder of the land to the west has been cleared and is used for cropping, while to the east the land, which was cleared in the early 1960s, has since regenerated. The land abutting the northern and southern boundaries, although used for grazing, remains uncleared.

This reserve is part of an extensive chain of salt lakes that follow an old river system which traverses the south-western corner of the Shire. Thus, this flat reserve is dominated by small seasonal salt lakes and associated Samphire flats, although there is some higher ground, limited in area, along the southern boundary.

2. HISTORY

The area appears to have remained unnoticed until November 1962 when it was inspected, following a Conditional Purchase application. The inspection noted that the:

- "1. area was suitable for alternate light cereal cropping and grazing;
2. whole area was subject to salt influence; and
3. area was unsuitable for water conservation."

(Grant Inspector in litt. to Surveyor General, Department of Lands and Surveys, 1962)

In July of the following year the Conditional Purchase lease was approved. In the same year the reserve was cleared and seeded with pasture. Clearing led to an alarming rise in salt levels, and the lessee subsequently advised the Department of Lands and Surveys that the land was of no value for agriculture. He also added that the area had ...

"...lovely wildflowers at times. The nesting birds in spring are numerous and gorgeous.... I would like to see it a proper flora and fauna reserve."

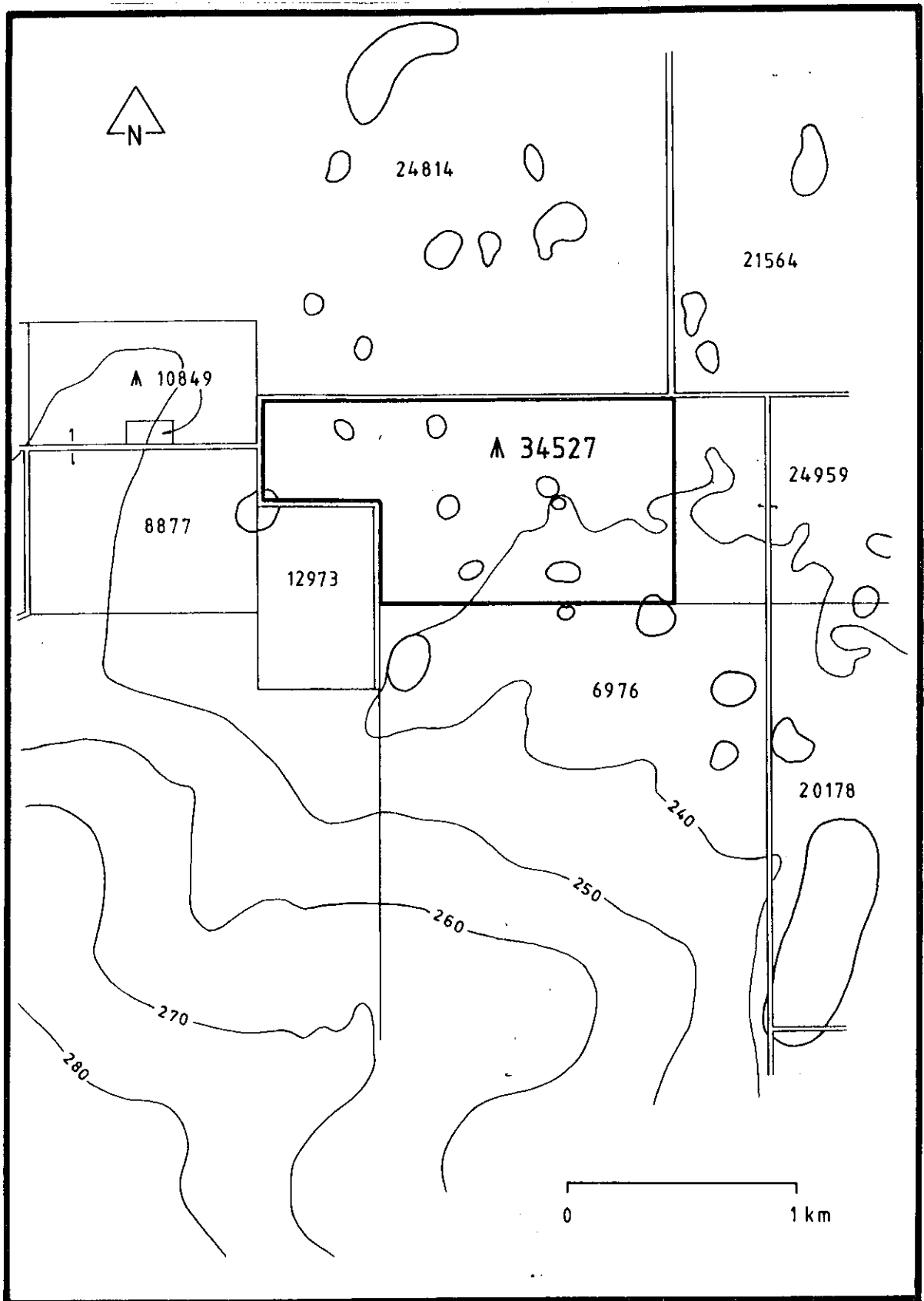


Figure 4. Derdibin Nature Reserve showing its relationship with surrounding lands and associated contours (m). (Source: Lands and Surveys 1:50 000 series.)

Consequently the lease was forfeited on 5 March 1976.

The District Wildlife Officer sent the following recommendation to the Supervising Wildlife Officer (Department of Fisheries and Wildlife) in late 1976:

"Birdlife was numerous.... This area I feel would make a good reserve, as being so isolated it would be rarely molested, a good large area with a lot of country surrounding it that is unlikely to be used for agriculture to any extent."

Thus, on 4 March 1977, the area was set aside for the Conservation of Flora and Fauna with vesting in WAWA.

3. SOILS AND VEGETATION

Throughout Derdibin Nature Reserve sandy clays predominate, with the soils becoming more clayey in the salt lakes.

The vegetation is less uniform, and is best described as a complex mosaic of small seasonal salt lakes surrounded by Samphire flats, separated by slightly elevated areas of Melaleuca-dominated scrub. On the higher, southern margins of the reserve York Gum low woodland and tree mallee occurs. Four associations have been delineated; these are distributed as shown in Figure 5, and are described as follows:

1. York gum (Eucalyptus loxophleba) Low Woodland A/Open Low Woodland A, 8 to 12 m in height, over Wait-a-while (Acacia colletioides) Scrub to 2.5 m, over Saltbush (Atriplex sp.) Dwarf scrub D.
2. York Gum Open Tree Mallee/Very Open Tree Mallee, 6 to 12 m in height, over Saltbush Dwarf Scrub D and Open Low Grass. Isolated patches of Melaleuca/Acacia Scrub to 2.5 m also occur.
3. Narrow-leaved Red Mallee (E. aff. foecunda) Open Shrub Mallee, 4 to 5 m in height, over Acacia filifolia and Broom Bush (Melaleuca uncinata) Heath A.
4. Salt lake complex : mosaic of small seasonal salt lakes and associated expanses of Samphire (Halosarcia pergranulata) to 0.25 m. Areas of slightly elevated ground within this association support a mixed Thicket/Scrub to Heath A/Low Scrub A, in which Broom Bush is dominant. Melaleuca thymoides is occasionally an important component.

4. FAUNA

Thirty-two bird species were recorded on Derdibin during pre-planning surveys. The following species are, at Derdibin, near the southern limits of their known range:

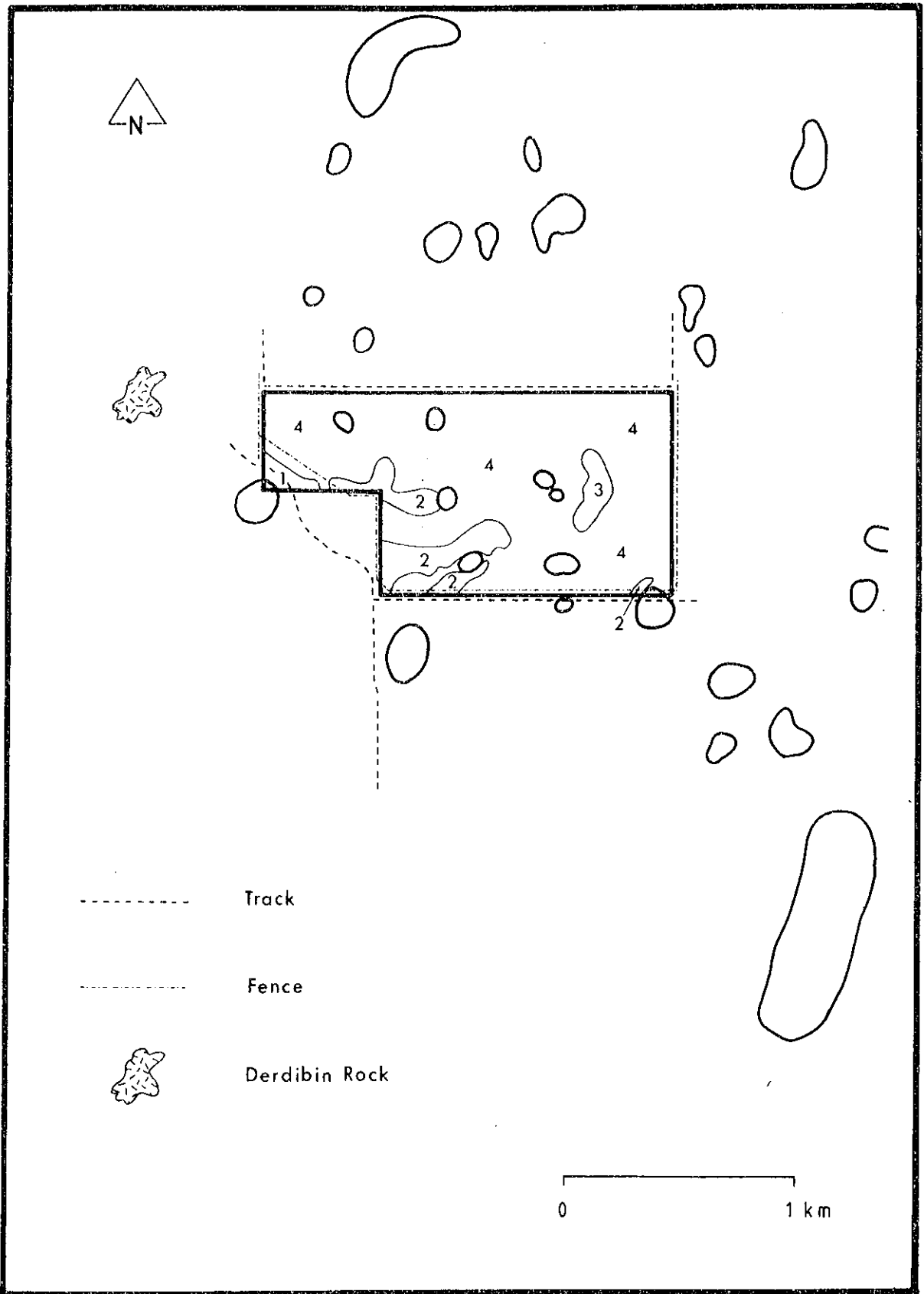


Figure 5. Dardibin Nature reserve showing tracks, fencelines and vegetation associations (identified by number and described in the associated text). (Source: Fisheries and Wildlife, 1984.)

the Crested Pigeon, Mulga Parrot and Spiny-cheeked Honeyeater (Slater, 1979). This is the only reserve in the Shire on which the Australian Grebe, Little Falcon, Welcome Swallow and Grey Currawong have been recorded.

Mammals sighted include Western Grey Kangaroos (Macropus fuliginosus), foxes, dogs and rabbits. One species of reptile has been recorded: the Western Bearded Dragon (Pogona minor).

Full surveys of the fauna have not been carried out, hence final conclusions cannot be drawn as to the faunistic values of the area.

5. PAST MANAGEMENT, USES AND FIRE HISTORY

As mentioned earlier the reserve was cleared, via chaining and windrowing, and sown to pasture in 1962. A small stand of York Gum on the southern boundary (Association 1 in Fig. 5) was the only vegetation left standing. As clearing led to a rapid increase in salinity and the land was considered of no value to agriculture, it was left to revegetate.

Today the vegetation on the reserve is still much lower and less dense than on the uncleared land to the north, and decaying windrows are still apparent. The Melaleuca scrub is considerably lower, and regenerating York Gums have the growth-form of mallees, rather than trees.

The reserve probably received little use, except for limited grazing, even in its days of conditional lease. There is no road access to the reserve and hence use of the area would have been, and still is, minimal.

Old fencelines stand along the southern, eastern and western boundaries. These are in varying states of repair, and in some places do not follow the surveyed boundaries (Fig. 5). A distinct track follows the unfenced northern boundary. There are no other significant boundary, or internal, tracks or firebreaks.

Nothing is known of the fire history of the reserve, although it appears that a clearing burn was carried out following chaining and windrowing in the early 1960s.

6. NATURE CONSERVATION VALUES

Derdibin is one of the two small reserves in the Shire that represent part of salt-lake systems. Salt lakes, although useless agriculturally, provide important habitat for many bird species. On Derdibin Melaleuca regrowth provides shelter for at least two species of parrot, four of warbler and three of honeyeater. In addition, this reserve provides one of only two records, for nature reserves in this Shire, of the Wedge-tailed Eagle.

No trapping programme to determine small mammals and

reptiles present has yet been conducted. However, it is likely that small marsupials, rodents and reptiles use the cover provided by the numerous decaying windrows. Western Grey Kangaroos seem to be common, successfully utilising the reserve for both shelter and grazing.

Although both the salt-lake reserves (Derdibin and Wallambin) are part of similar landscapes, there are interesting differences between the two. York Gum is found on both reserves, while Salmon Gum is limited to Wallambin. Also, although both reserves carry Broom Bush, the co-dominant varies, with Melaleuca thymoides on Derdibin and Melaleuca lateriflora on Wallambin. Only Derdibin supports an unusual, salt-tolerant form of Narrow-leaved Red Mallee, a plant that may be of economic value in the revegetation of land damaged by salt. This eucalypt, plus an undescribed species of Acacia growing in the same area, have only been recorded from Derdibin, and have not been previously described.

B. PLAN FOR MANAGEMENT

1. MANAGEMENT OBJECTIVES

Management will be directed primarily towards the enhancement of the conservation values of Dardibin Nature Reserve. This is best achieved by minimum interference, allowing the process of regeneration, now well underway, to continue. The isolation of this reserve in the midst of farmland, remote from public roads, will complement this objective.

Management is expected to be required in the following fields during the course of operation of this plan:

Protection from Fire

To protect the assets of reserve neighbours, and at the same time protect the natural values of the reserve.

To minimise the risk of occurrence of wildfires on the reserve and to suppress such wildfires as may occur.

Protection from Pests : Animal and Weed Control

To protect the reserve and surrounding farmlands from damage by plant and animal pests, particularly those that are declared from time to time under the provisions of the Agricultural and Related Resources Protection Act (1976, as amended).

Public Use and Research

To continue with a program of conservative management in regard to public use in keeping with the remote location of this area.

To use the area for the study of regeneration of vegetation in salt-affected country.

2. PROTECTION FROM FIRE

The position of Dardibin in the midst of a salt-lake system minimises the risk of fires, both from fires originating on the reserve, and from fires moving across the salt lake system towards the reserve. Also, most of the agriculturally suitable land near the reserve has been cleared, and thus the threat to the reserve from clearing burns is minimised. For these reasons there is no perceived need to construct firebreaks, or implement other active fire protection measures on Dardibin - measures that would interfere with regeneration of the salt-tolerant vegetation. In the unlikely event of fire crossing the reserve boundaries, the numerous small salt lakes and flats would act as natural firebreaks.

Firebreak Construction

There is no need to construct firebreaks during the currency of this plan (10 years). However, it should be ensured that the track along the northern boundary of the reserve remains passable, as it provides access to the reserve for management purposes.

Fire Suppression

Fire-fighting units from the Department of Fisheries and Wildlife at Wanneroo will, where possible (subject to the limitations of personnel and equipment), attend fires occurring on the reserve, or considered to be threatening it.

Adequacy of Control Measures

Special attention will be paid to the views of reserve neighbours and concerned local authorities in the matter of maintaining measures for fire protection. Through this plan formal provision is made for the individuals or groups affected to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the fire protection arrangements for the reserve.

Notifiable Authority

The Department of Fisheries and Wildlife shall be regarded as a Notifiable Authority in terms of the Bush Fires Act and Regulations (1954, as amended) in respect of the reserve.

3. PROTECTION FROM PESTS : ANIMAL AND WEED CONTROL

Control of pest animals and plants may be necessary from time to time to protect the reserve environment and its flora and fauna, and as part of organised pest control in the surrounding area. The necessary arrangements for organised control will be made by consultation and co-operation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

Adequacy of Control Measures

As with the provisions for fire protection, reserve neighbours or the local authority, or both, are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the control of pest plants and animals on the reserve. On receipt of such comments the Director may organise a joint inspection, or take other action as may be needed to remedy the situation.

4. PUBLIC USE AND RESEARCH

Derdibin, isolated from public roads and inaccessible by

vehicle for much of the year, is little used by the public. However, local residents have long appreciated the area for its spring wildflowers. Thus, public use should remain low key with the local community continuing to appreciate and protect the reserve for its conservation values.

Access

Most of the reserve is inaccessible by vehicle, the only exception being a track that follows the northern boundary. This track becomes impassable during the winter months. Maintenance of this degree of inaccessibility is in keeping with the existing and proposed low level of public use.

Fencing

To date the absence of a northern boundary fence has not led to any movement of stock onto Derdibin. However, if it appears that stock are using the reserve, it may be necessary for the adjacent landholder to fence his southern boundary.

Signs

A sign, conforming to the standard specifications for the Department of Fisheries and Wildlife and identifying the area as Derdibin Nature Reserve, will be erected at the south-western corner of the reserve. The standard specifications are based on wooden routed signs, with pale yellow lettering on an olive green background.

Research

Derdibin is highly amenable to studies of the regenerative processes of salt tolerant species. The population of eucalypts in the centre of the reserve is of particular interest. This form of the species has strong similarities to the Narrow-leaved Red Mallee, however, there are some marked differences, particularly the degree of salt tolerance exhibited by the Derdibin form. This mallee is successfully regenerating following chaining and burning in the early 1960s, and its vigorous growth under saline conditions may make it a highly suitable species for planting in salt-affected agricultural areas.

PART 3 : WALLAMBIN NATURE RESERVE (NO. 21719)

A. THE RESERVE

1. PHYSICAL CHARACTERISTICS AND RELATIONSHIPS

Wallambin Nature Reserve is 21 km north-north-east of Wyalkatchem, on the south-western edge of Lake Wallambin (Fig. 3). Lackman Road passes along the western boundary of this irregularly shaped reserve (Fig. 6) which has an area of 121.5 ha and a perimeter of some 5 km.

The land to the west and south of the reserve is privately owned, and has been cleared and used for cropping. Lake Wallambin (Reserve No. 19687 - Government Requirements) abuts the eastern boundary. A small block of parkland cleared, privately owned land adjoins most of the northern boundary. The reserve is flat, with a variation in elevation of less than 10 m; the highest points are in the north-western and south-western corners. Much of the flat interior is occupied by two seasonal salt lakes.

2. HISTORY

Little interest was shown in this area until 1937, when the Surveyor General (Department of Lands and Surveys) organised a survey following a Conditional Purchase application. The following recommendations were made to the Under Secretary for Lands.

"...the existing timber, if not destroyed, will prevent the salt spreading into adjoining holdings and I strongly recommend that this block is declared a reserve as it forms a good buffer for the blocks on the west. It is useless for cultivation purposes."

Thus, on 10 May 1937 the reserve was set aside for Public Utility. Over the next four decades, from 1940 to 1978, grazing leases were held over the area.

In 1975 the Divisional Surveyor (Department of Lands and Surveys) noted that the reserve was not being actively used for grazing. In the following year the Department of Lands and Surveys recommended the inclusion of the public utility reserve (No. 21719) in Lake Wallambin Reserve (No. 19685), with a proposed purpose of Conservation of Flora and Fauna. The Mines Department opposed the inclusion and change of purpose on the grounds that Lake Wallambin was a useful source of gypsum.

The Divisional Surveyor recommended that:

"...(conservation of flora and fauna) is a far better use for this reserve than its very limited value for commercial grazing purposes".

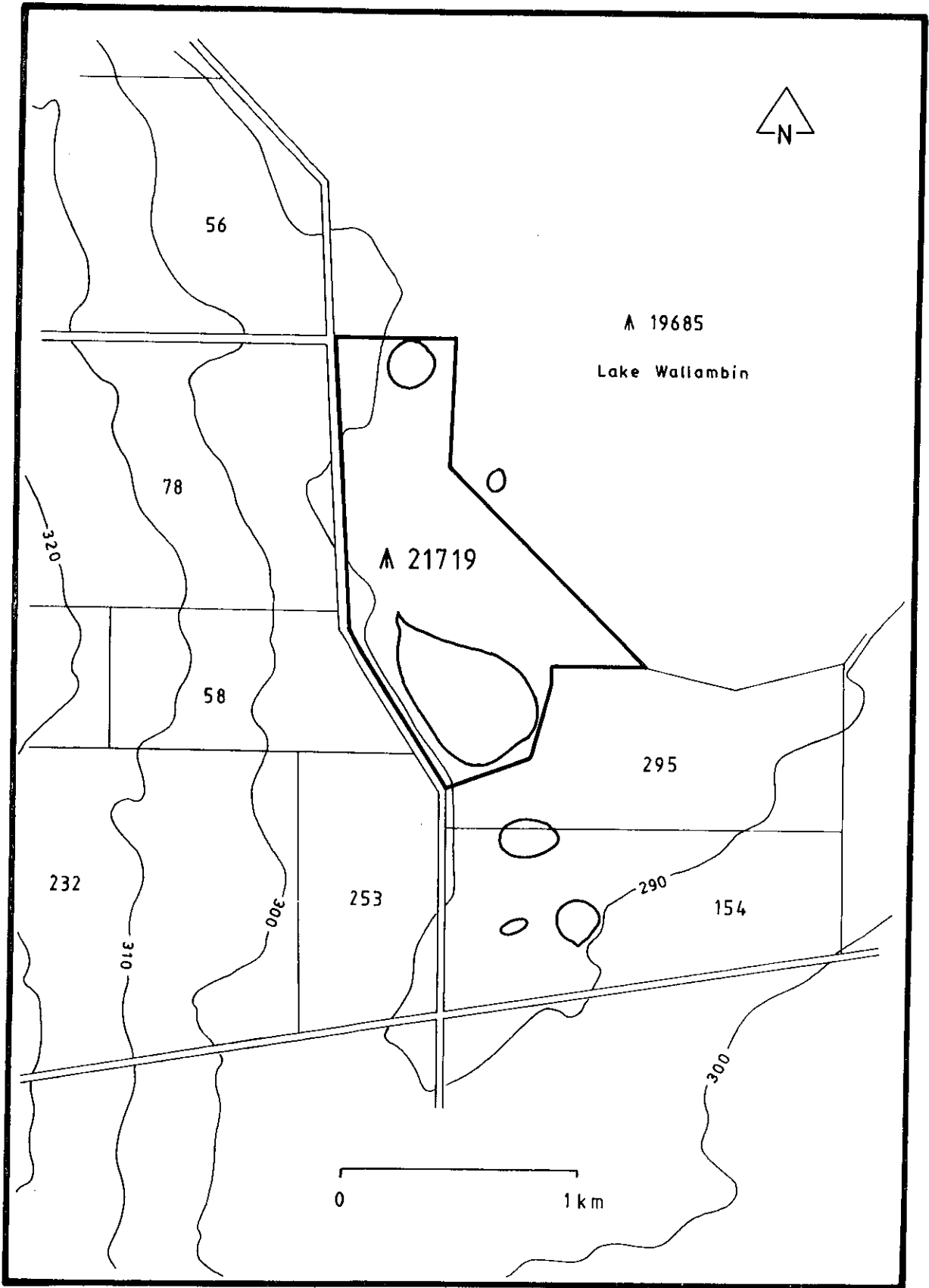


Figure 6. Wallabin Nature Reserve showing its relationship with surrounding lands and associated contours (m). (Source: Lands and Surveys 1:50 000 series.)

(in litt. to Surveyor General, Department of Lands and Surveys, 1978)

This led to an agreement by the Mines Department to a change in purpose for the small area covered by Reserve No. 21719. Following the termination of the lease in 1978 (the area only ever having been used to provide emergency grazing over the summer months), the purpose of the reserve was changed to Conservation of Flora and Fauna, with vesting in WAWA, on 30 March 1979.

3. SOILS AND VEGETATION

Most of the soils of Wallambin Nature Reserve are dominated by clays, which become heavier on the lake beds and Samphire flats. On the slightly elevated areas the soils are more loamy.

Similarly to Derdibin, relatively uniform soils support a complex mosaic of vegetation types. This mosaic includes seasonal salt lakes and surrounding Samphire flats, and elevated lake margins. These margins are dominated in different places by *Melaleuca* thickets, grassland, and occasional York and Salmon Gums.

On Wallambin four associations have been identified as shown in Figure 7, and may be described as follows:

1. Seasonal salt lakes: shallow clay pans that support a narrow belt of Samphire (*Halosarcia pergranulata*) around the perimeter.
2. Samphire flats: Samphire Low Heath D to 0.25 m.
3. Grassland: Low Grass and scattered Saltbush (*Atriplex* sp.) to 0.5 m with a few degenerate eucalypts emerging to about 18 m.
4. Elevated margins of salt lakes: Broom bush (*Melaleuca uncinata*) and *Melaleuca lateriflora* Thicket/Scrub to 3 m, with *Acacia colletioides* to 2.5 m, over a saltbush dominated Dwarf Scrub D and Open Grass understorey. On the higher ground on the western boundary Salmon Gum (*Eucalyptus salmonophloia*) and York Gum (*E. loxophleba*) are occasionally emergent to 15 - 20 m.

4. FAUNA

Although only 27 species of bird have been recorded on this reserve, it is expected that many more species, particularly waterbirds, would use the reserve during the wetter months. Two of the waterbirds recorded on this reserve, the Maned Duck and the White-faced Heron, have not yet been recorded on any other nature reserve within the Shire. Also, Derdibin is the only nature reserve within the Shire on which Emus have been recorded.

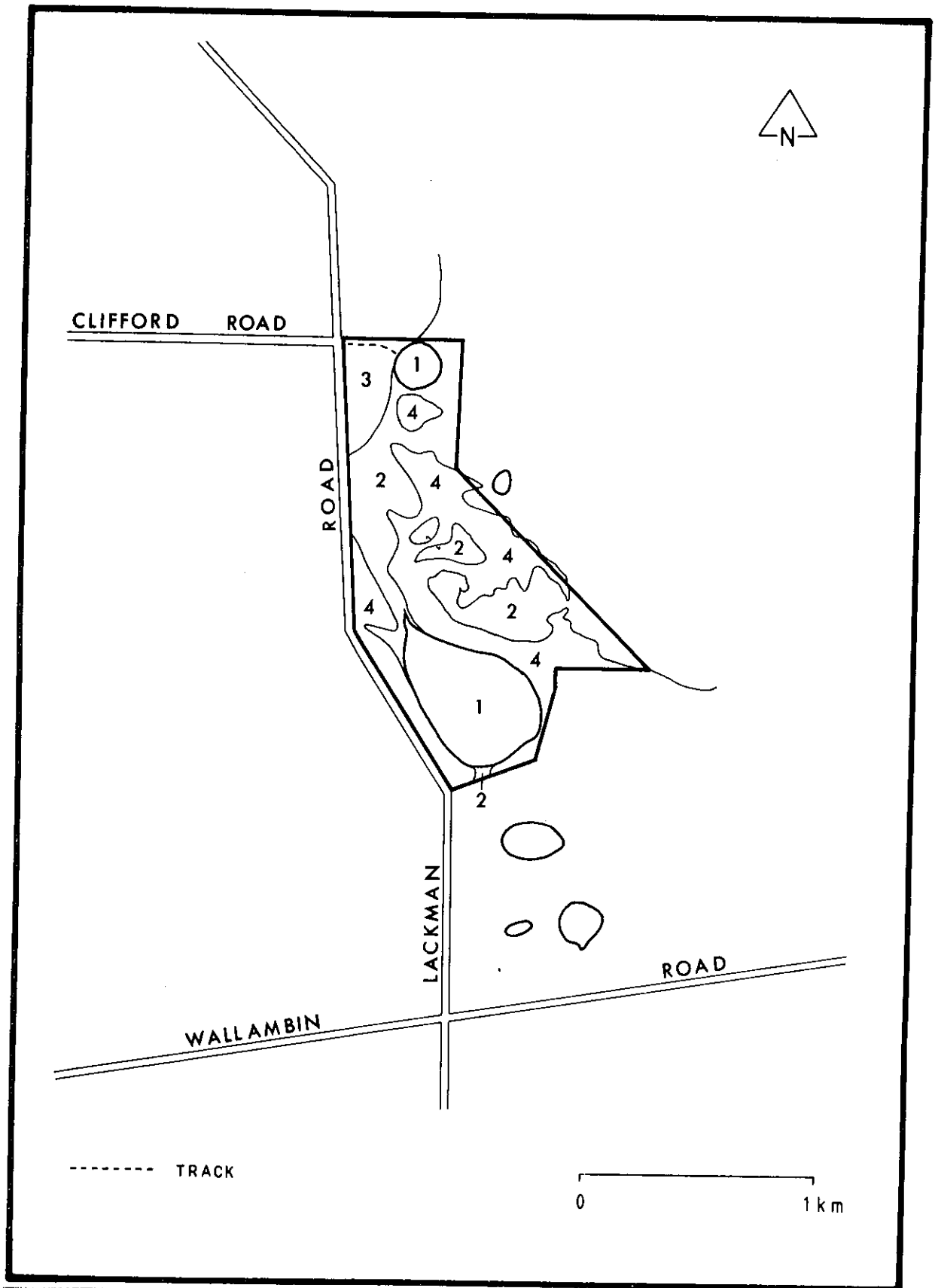


Figure 7. Wallambin Nature Reserve showing tracks and vegetation associations, which are identified by number and described in the associated text (Source: Fisheries and Wildlife, 1984).

Mammals sighted include Western Grey Kangaroos (Macropus fuliginosus), Euros (M. robustus), Echidnas (Tachyglossus aculeatus), rabbits and foxes. However, similarly to Derdibin, full surveys of the fauna have not been carried out, and so no final conclusions can be drawn as to its faunistic values.

5. PAST MANAGEMENT, USES AND FIRE HISTORY

The areas adjacent to the nature reserve appear to have been subject to considerable pressure from use. Lake Wallambin, on the northern and eastern sides of the reserve, has been worked for salt from the time of first settlement. The land on the western and southern sides has been long cleared and under crop. Very little native vegetation remains.

Wallambin Nature Reserve has also been used for many years, primarily as a summer grazing area for stock. While the area was under grazing lease the north-western corner was cleared (Association 3: grassland with occasional saltbush and degenerate eucalypts - Fig. 7). Also, in this northern part of the reserve, a track leads to a large rubbish dump on the edge of one of the salt lakes.

There are no other distinct tracks or firebreaks on the reserve. The farmlands on the western and southern sides have good boundary firebreaks and fences. No other shared boundaries are fenced.

Although no records of fire history exist for the reserve, it does not appear to have been burnt recently.

6. NATURE CONSERVATION VALUES

This salt-lake wetland, similarly to Derdibin, is important as it provides a seasonal wetland for waterbirds. On a brief visit to the area (Reserve Management, Department of Fisheries and Wildlife) in the spring of 1982, Black Swans and their cygnets were seen on the lakes. Small birds such as Thornbills, Pipits and Chats were using the scrub along the lake edges, and several Galahs were nesting in the Salmon Gums on the western boundary. A second visit at the end of summer in 1983 showed a massive decrease in bird numbers, suggesting that the numbers of birds on the reserve fluctuates greatly, depending on the season. The area is probably also used by many small birds that can survive in a cleared wheatbelt environment for most of the year, relying on areas such as Wallambin for refuge and breeding.

Wallambin is the only nature reserve within the Shire that includes a sample, albeit quite small, of York and Salmon Gum woodland. This formation once occurred extensively throughout the Shire. Within this distribution it indicates some degree of salt tolerance, in many places growing close to the margins of salt lakes.

Although no trapping programme has yet been implemented, it is thought that the Fat-tailed Dunnart (Sminthopsis crassicaudata) may inhabit the Samphire flats (J. Rolfe, Department of Fisheries and Wildlife, pers. comm., 1983).

B. PLAN FOR MANAGEMENT

1. MANAGEMENT OBJECTIVES

The management of this reserve will remain conservative, being directed towards enhancing the conservation values of the area.

Wallambin has a long history of grazing, having been used as a summer pasture for many years. As a result, parts of the reserve are dominated by grassland, particularly the north-western corner, which was cleared at one stage. Left alone, these areas will eventually recover, and at the same time continue to protect the seasonal lake system. These needs guide the following management objectives:

Protection from Fire

To protect the assets of reserve neighbours, and at the same time protect the natural values of the reserve.

To minimise the risk of occurrence of wildfires on the reserve and to suppress such wildfires as may occur.

Protection from Pests: Animal and Weed Control

To protect the reserve and surrounding farmlands from damage by plant and animal pests, particularly those that are declared from time to time under the provisions of the Agriculture and Related Resources Protection Act (1976, as amended).

Rehabilitation and Maintenance of the Natural Environment

To restore the area degraded by rubbish dumping.

Public Use

To maintain a conservative approach to public use in keeping with the remote location of the reserve, which is removed from major roads.

2. PROTECTION FROM FIRE

Rationale

The position of Wallambin Nature Reserve, on the edge of Lake Wallambin (with an area of 9807.6 km²), minimises the risk of fire, while cleared agricultural land on the remaining sides reduces the risk further. In addition, the significant contribution of salt lake to the total area means that about half the reserve is a natural low fuel area.

Firebreak Construction

There is no perceived need to implement active fire protection measures such as firebreak construction. In

the unlikely event of fire on the reserve, it would be stopped either by one of the salt lakes, or by the western boundary road.

Fire Suppression

In the event of fire occurring on, or moving towards, the reserve, fire-fighting units from the Department of the Department of Fisheries and Wildlife at Wanneroo will attend where possible, subject to the limitations of personnel and equipment.

Adequacy of Control Measures

Special attention will be paid to the views of reserve neighbours and concerned local authorities in the matter of maintaining measures for fire protection. This plan provides for the individuals or groups affected to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the fire protection arrangements for the reserve.

Notifiable Authority

The Department of Fisheries and Wildlife shall be regarded as a Notifiable Authority in terms of the Bush Fires Act and Regulations (1954, as amended) in respect of the reserve.

3. PROTECTION FROM PESTS: ANIMAL AND WEED CONTROL

Control of pest animals and plants may be necessary from time to time to protect the reserve environment and its flora and fauna, and as part of organised pest control in the surrounding area. On Wallambin the grasslands provide an ideal environment for rabbits. Thus, regular inspections are necessary to determine when numbers reach unacceptable levels. If necessary, control measures will be instigated by the Department of Fisheries and Wildlife, and implemented by the Agriculture Protection Board. Similarly, when organised control of declared plants and animals is necessary, it shall be by consultation and cooperation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

Adequacy and Control Measures

As with the provisions for fire protection, reserve neighbours or the local authority, or both, are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the control of pest plants and animals on the reserve. On receipt of such comments the Director may organise a joint inspection, or take other action as may be needed to remedy the situation.

4. REHABILITATION AND MAINTENANCE OF THE NATURAL ENVIRONMENT

Rubbish Dumping

The rubbish dumped on the northern edge of the northern most salt lake will be buried. Future management will be directed towards minimising further activities of this kind.

5. PUBLIC USE

Wallambin, remote from the main traffic routes, and most of it accessible only by foot, is little used by the public. Thus, use should remain low key, with activities such as birdwatching, particularly around the salt lakes during winter and spring, and wildflower study being encouraged.

Signs

Signs giving the reserve name will be erected on the south-western corner of the reserve and on the north-western corner adjacent to the track leaving Lackman Road. These will comply with the signs standard for the Department of Fisheries and Wildlife, which is based on wooden routed signs with pale yellow lettering on an olive green background.

PART 4 : KORRELOCKING NATURE RESERVE (NO. 689)

A. THE RESERVE

1. PHYSICAL CHARACTERISTICS AND RELATIONSHIPS

Korrelocking, a square reserve with an area of 259.0 ha and a perimeter of about 6.5 km, is 4 km east of Wyalkatchem Nature Reserve, and 7 km east of Wyalkatchem (Fig. 3). Two gravel roads are associated with the reserve: Goldfields Road and a water pipeline follow the northern boundary, and Tyler Road cuts the reserve diagonally from north-west to south-east.

The reserve lies in gently undulating cleared farmland, the only exception being a small area of Jam woodland, used by stock for shelter and grazing, on the north-eastern corner. The reserve falls from 350 m in the north-eastern corner to just over 300 m in the south-west (Fig. 8).

2. HISTORY

Korrelocking Reserve was originally set aside as a Stopping Place for Teams on 19 June 1884. Requests to open part or all of the reserve for selection began soon after and continued sporadically over the next 50 years. In June 1919 the Ninghan Road Board (forerunner of Wyalkatchem Shire Council) spent five pounds on cleaning out and fencing two soaks on the reserve, and continued to

"strongly disapprove of any option of the ...
reserve being alienated".

Several requests, by the Under Secretary for Water Supply to the Under Secretary for Lands, resulted in a change in purpose to Water on 3 February 1922 with vesting in the Minister for Water Supply, Sewerage and Drainage.

Requests regarding release of the reserve for agriculture continued. However, the value of the area as a conservation reserve continued to be recognised:

"Reserve 689A is a valuable one and will become more valuable as time goes on, particularly in view of the fact that it carries two soaks and is so close to the Korrelocking Railway Station. It will undoubtedly be made use of very largely as a holding group for stock waiting railage. It would be a great mistake to alienate it and I recommend that any request for throwing it open be refused."

(Surveyor General in litt. to Under Secretary for Lands, Department of Lands and Surveys, 8 January 1925)

Thus the reserve was used for grazing from its first days, and in 1960 a grazing lease over the area was approved.

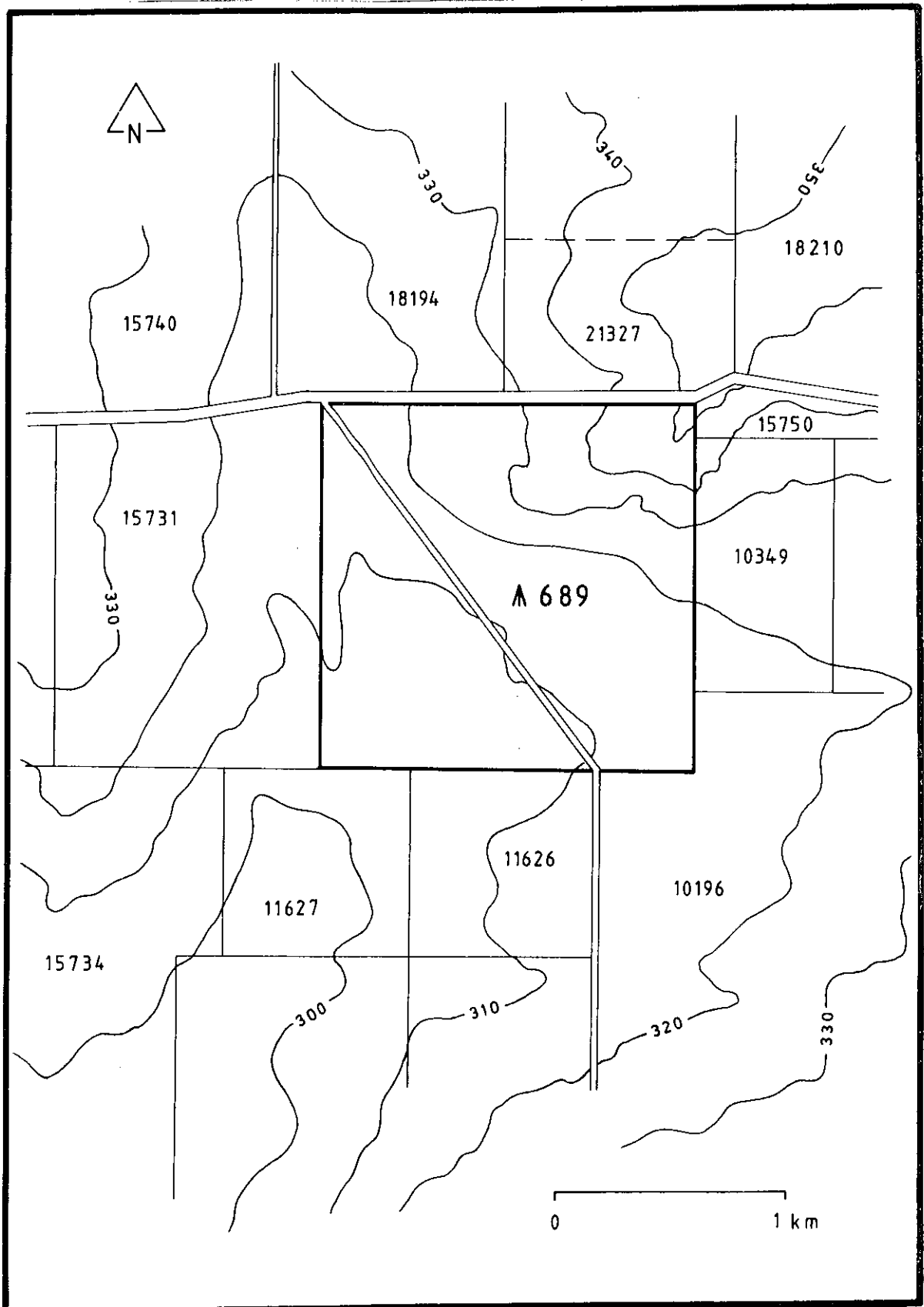


Figure 8. Korrelocking Nature Reserve showing its relationship with surrounding lands and associated contours (m). (Source: Lands and Surveys 1:50 000 series.)

This was terminated in 1978 due to the

"...contention that grazing activities are causing damage and disturbance to flora and fauna."

(Under Secretary for Works in litt. to Under Secretary, Public Works Department, 8 December 1978).

This communication was the result of correspondence (part of which is extracted below) between Wyalkatchem Shire Council and the Department of Lands and Surveys in the preceding year.

"At its last regular meeting the Council directed me to make application to your Department to effect a change in the purpose of this Reserve from Water to Protection of Flora and Fauna with vesting in the Shire of Wyalkatchem.

The Reserve is heavily timbered and contains some of the best Salmon Gums to be seen in the Shire. As well as being a sanctuary for kangaroos and other forms of animal and bird life indigenous to this part of the wheatbelt, it is also a very popular picnicking place for local people especially during spring when it abounds with wildflowers".

(Shire Clerk, Wyalkatchem Shire Council in litt. to Under Secretary, Department of Lands and Surveys, 13 October 1977).

In March 1979 the Director of the Department of Fisheries and Wildlife wrote to the Under Secretary for Works, Public Works Department, emphasising the conservation values of Korrelocking, and recommending a change in purpose to Conservation of Flora and Fauna, with vesting in WAWA. Following close liaison between Lands and Surveys, Fisheries and Wildlife and the Shire of Wyalkatchem, a set of conditions for joint vesting was drafted and approved by all parties. Korrelocking was set aside on 1 July 1983 for Conservation of Flora and Fauna, with joint vesting in the Department of Fisheries and Wildlife and the Shire of Wyalkatchem.

3. SOILS AND VEGETATION

Korrelocking is dominated by mature Salmon Gum and Gimlet woodland on sandy clays and loams. On the higher ground in the north-east granite outcrops are surrounded by York Gum and Jam on red-brown loams. A dense Melaleuca thicket surrounding a seasonal swamp occurs on heavier soils in the south-western corner. These three associations are delineated in Figure 9 and described below.

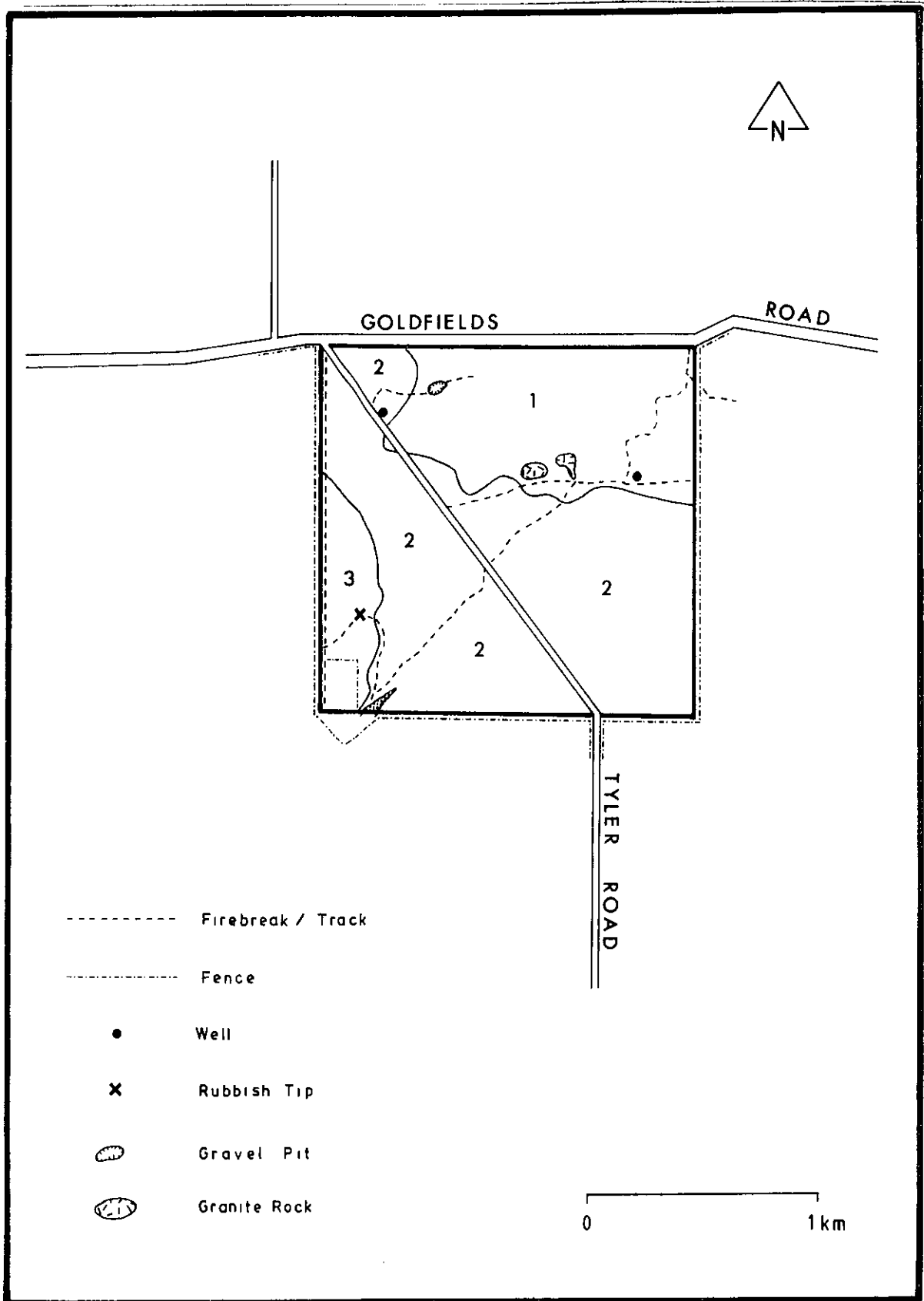


Figure 9. Korrelocking Nature Reserve showing features and vegetation associations (identified by number and described in the associated text). (Source: Fisheries and Wildlife, 1984.) The stippled area in the south-western corner indicates an area subject to seasonal flooding.

1. York gum (Eucalyptus loxophleba) Low Woodland A/Open Low Woodland A, 8-15 m in height, over Jam (Acacia acuminata), 4-8 m in height, over Low Grass. Open grasslands, on shallow soils associated with granite outcropping, are a component of this association.
2. Salmon Gum (E. salmonophloia) and Gimlet (E. salubris) Woodland, 15-25 m in height, with York Gum becoming an important component in the north-western corner.

The Scrub understorey is dominated by Leafless Ballarat (Exocarpus aphylla) and Sweet Quandong (Santalum acuminatum). Other components are Acacia acuaria, Acacia hemiteles, Acacia erinacea, Dusk Daisy-bush (Olearia muellerii) and Saltbush (Atriplex sp.).

3. Broom Bush (Melaleuca uncinata) and Melaleuca viminea Thicket, 2-3 m in height, over an open understorey. On the western boundary this association becomes more open, with Red-flowered Mallee (E. erythronema), York gum and Oil Mallee (E. plenissima) a component.

4. FAUNA

Forty four bird species have been recorded on Korrelocking. This is the highest number of species so far recorded on a nature reserve within this Shire. Of these, six, - the Pacific Heron, Black-shouldered Kite, Whistling Kite, Little Eagle, Black-tailed Native-hen and Long-billed Corella - have been recorded on no other nature reserve in the Shire.

The nature reserves with eucalypt woodlands - Korrelocking, Wyalkatchem and Nembudding - provide habitat for several birds which have not been recorded on any other reserves in the Shire. One of these is Horsefield's Bronze Cuckoo, a migratory species, here on the southern edge of its known distribution and recorded only on Korrelocking and Wyalkatchem. Two other species, the Elegant Parrot and Silvereye, have only been recorded on these woodland reserves.

Mammals sighted include the Western Grey Kangaroo (Macropus fuliginosus) and the rabbit. As with other reserves in the Shire, full surveys of the fauna have not been undertaken. Therefore, no conclusions can be drawn as to the faunistic values of the reserve.

5. PAST MANAGEMENT, USES AND FIRE HISTORY

The reserve has been used by people and stock for 100 years, from the time of its gazettal as a Stopping Place for Teams in 1884. For most of this time grazing has been the main form of use: firstly, by stock awaiting rail haulage; and secondly, by stock run under grazing leases (from 1960 to 1978). This long history of grazing has

probably resulted in the disappearance of some understorey species; termination of the lease was based on such a realisation. Stock were subsequently removed, and most of the internal fencing had been removed by February 1984.

Other secondary uses include gravel removal, on the northern boundary, and rubbish dumping, in the south-western corner. Most of the rubbish is farm-related materials. Several old vehicle tracks, now disused, cut through the reserve. Exotic grasses and weeds occur along the boundaries, and round the rubbish dump and gravel pit.

Korrelocking has an incomplete firebreak system. Firebreaks follow the western boundary and the northern boundary adjacent to the water pipeline. The southern and eastern boundaries are without firebreaks. All neighbouring lands have adequate firebreaks. The reserve is fenced on three sides, the only exception being the northern boundary, along which the gravel road and pipeline pass.

No specific fire history is available for the reserve. However, examination of aerial photographs and the vegetation suggests that the area has not been burnt for many years.

6. NATURE CONSERVATION VALUES

The following extracts from correspondence between the Director of the Department of Fisheries and Wildlife and the Under Secretary for Works (23 March 1979), summarises the inherent values of Korrelocking.

"Although the reserve has been affected by grazing in the past and introduced grasses are established in some areas, the reserve is valuable for conservation. Particularly important is the open woodland, mostly of Salmon Gum, with some York Gum and Gimlet; these species are poorly represented in conservation reserves, owing to clearing for agriculture. Moreover, the large Salmon Gums provide ideal nesting-sites for parrots and cockatoos. At the time of inspection, 120 Red-tailed Black-cockatoos and numerous Galahs and Twenty-eight Parrots (Port Lincoln Ringnecks) were sighted.

The granite outcrops provide habitat for reptiles and the dry swamps provide a further type of animal habitat."

It is apparent that this is one of the most important conservation areas in the Shire. It contains three distinct habitats, incorporating superb Salmon Gum and Gimlet woodland, York Gum and Jam low woodland and a winter-wet swampland dominated by dense Melaleuca thicket. The combination of large size and diversity provides suitable habitat for not only large mammals and nomadic and migratory birds, but also resident bird species, plus

small mammals, reptiles and frogs.

Parrots are especially abundant on Korrelocking. Five species - the Red-tailed Black cockatoo, Galah, Long-billed Corella, Port Lincoln Ringneck and Elegant Parrot - have been recorded on the reserve, and all of these breed in the woodlands that cover most of the area. This is the highest number of parrot species recorded from one Wyalkatchem nature reserve, and the only record of the Long-billed Corella.

Korrelocking is aesthetically pleasing and free from rubbish except for the dump on the western boundary. A seasonal stream cuts through the southern part of the reserve, and this forms an attractive chain of pools in the winter months. This is further complemented by two stone-lined wells of some historic interest.

B. PLAN FOR MANAGEMENT

1. MANAGEMENT OBJECTIVES

Management will be primarily directed towards maintenance of the conservation values of the reserve. Facilitation of uses and research appropriate to a nature reserve are objectives of second priority.

Management will be required in the following fields during the course of operation of this plan:

Protection from Fire

To protect the assets of reserve neighbours, and the natural values of the reserve.

To minimise the occurrence of wildfires on the reserve and to suppress such wildfires as may occur.

Protection from Pests : Animal and Weed Control

To protect the reserve and surrounding farmlands from damage by plant and animal pests, particularly those that are declared from time to time under the provisions of the Agriculture and Related Resources Protection Act (1976, as amended).

Rehabilitation and Maintenance of the Natural Environment

To restore areas degraded by gravel removal, rubbish dumping, and to remove old fencelines.

Public use

To encourage the public to use the reserve for nature study. All public use should remain of secondary importance to the maintenance of the nature conservation values of Korrelocking.

Research

To make Korrelocking available for appropriate research, particularly that orientated towards long-term management of wheatbelt reserves or Salmon Gum communities.

To regularly inspect the reserve and record broad changes in the structure and composition of the vegetation.

2. PROTECTION FROM FIRE

Rationale

It is important to exclude fire from Korrelocking for several reasons. First, Salmon Gum communities are particularly sensitive to fire, and following severe fire regenerate only from seed; whereas many other eucalypts regenerate from rootstock, or rootstock and seed. Second,

even if a fire of low intensity moved through the reserve, many of the tree hollows and foliage used by birds would be lost. Third, exclusion of fire is necessary to enable regeneration of the understorey following the cessation of grazing. Finally, burning will only serve to encourage further weed invasion.

Fortunately Korrelocking, set amid cleared farmland and with a sparse to non-existent understorey, presents very little fire risk. Fire protection will be based on the following provisions:

Maintenance of Firebreaks on Adjacent Properties

As with other nature reserves within the Shire, discussions between the Shire Council and reserve neighbours have led to an expression of willingness by the adjoining landholders to maintain firebreaks of a suitable standard on their properties where they abut the reserve. Both the Shire Council and reserve neighbours see no need for firebreaks on the reserve, provided the boundary firebreaks on adjacent properties are regularly maintained. There are two significant advantages to be gained from this approach. First, the size of these small reserves is often reduced by as much as a tenth by the construction of perimeter firebreaks. And second, the absence of firebreaks prevents the movement of vehicles onto the reserve and into formerly inaccessible areas.

Fire Suppression

Fire-fighting units from the Department of Fisheries and Wildlife at Wanneroo will, where possible (subject to the limitations of personnel and equipment), attend fires occurring on, or considered to be threatening, the reserve.

Adequacy of Control Measures

Special attention will be paid to the views of reserve neighbours and concerned local authorities in the matter of maintaining measures for fire protection. Through this plan formal provision is made for the individuals or groups affected to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the fire protection arrangements for the reserve.

Notifiable Authority

The Department of Fisheries and Wildlife shall be regarded as a Notifiable Authority in terms of the Bush Fires Act and Regulations (1954, as amended) in respect of the reserve.

3. PROTECTION FROM PESTS : ANIMAL AND WEED CONTROL

Control of pest animals and plants may be necessary from time to time to protect the reserve environment and its flora and fauna, and as part of organised pest control in the surrounding area. The necessary arrangements for organised control will be made by consultation and cooperation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

Adequacy of Control Measures

As with the provisions for fire protection, reserve neighbours or the local authority, or both, are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the control of pest plants and animals on the reserve. On receipt of such comments the Director may organise a joint inspection or take other action as may be needed to remedy the situation.

4. REHABILITATION AND MAINTENANCE OF THE NATURAL ENVIRONMENT

Rehabilitation of Gravel Pits

The area degraded by gravel extraction and associated access tracks will be ripped to encourage re-establishment of the vegetation.

Rubbish

The rubbish dumped on the western edge of the reserve will be buried.

Removal of Old Fencelines

Any internal fencing on the reserve will be removed during the currency of this plan.

5. PUBLIC USE

Korrelocking, containing attractive stands of mature Salmon Gum and Gimlet and an associated wealth of birdlife and located close to Wyalkatchem, is ideally suited for public uses such as nature study, picnicking and bushwalking.

Access

Because Korrelocking is near the town of Wyalkatchem, and is largely accessible to vehicles, it is highly likely that use of the reserve by vehicles will increase. This will lead to damage and degradation of the reserve environment. Such movements are best prevented by classifying Korrelocking as a LIMITED ACCESS AREA under Section 12A of the Wildlife Conservation Act (1950, as amended). This will allow access to all parts of the reserve on foot, restricting vehicles to the bisecting and northern boundary roads.

Closure of Tracks

In keeping with the classification of LIMITED ACCESS AREA all internal tracks will be closed to motor vehicles. In reality these tracks are rarely used, and most are now barely discernible on the ground.

Signs

Signs identifying the reserve as Korrelocking Nature Reserve will be erected at the north-western corner and southern ends of the bisecting gravel road, and will be accompanied by signs denoting and explaining the access limitations. All signs erected will comply with the the Department of Fisheries and Wildlife signs standard, which is based on wooden routed signs, with pale yellow lettering on an olive green background.

6. RESEARCH

Several aspects of Korrelocking warrant research. First, the Salmon Gum and Gimlet, and York Gum associations provide an ideal opportunity for the study of mature wheatbelt woodlands and their associated fauna. Second, the area's long freedom from fire increases the likelihood that it may support populations of small mammals and numbers of reptile species. Finally, regular monitoring would give insight into regeneration following exclusion of stock from woodland communities in the wheatbelt.

A. THE RESERVE

1. PHYSICAL CHARACTERISTICS AND RELATIONSHIPS

Nembudding Nature Reserve, with an area of 14.2 ha and a perimeter of 1.8 km, is 18 km east of Wyalkatchem (Fig. 3). It is rectangular, with the longer axis running east-west. Nembudding Bin Road follows the southern boundary, and Nembudding-North Road cuts through the western end of the reserve. A timber reserve (No. 24105) abuts the western boundary. The remaining sides of the reserve are bounded by cleared, privately owned agricultural land.

The reserve lies in gently undulating country. Within the reserve the altitude varies by less than 10 m (Fig. 10).

2. HISTORY

Nembudding Nature Reserve, which was originally part of a grazing lease, was resumed on 28 October 1913, two years after the completion of the Dowerin-Merredin loop-line, to create Homebush townsite. The site was surveyed into lots and renamed Monembudding, after nearby Monembudding Tank, as the name Homebush had led to confusion with a similarly named suburb of Sydney. It was not until two years later that the name Nembudding, an Aboriginal place name, was finally selected. The townsite was developed in plan to the level of naming the streets and pricing individual lots.

The town never eventuated however, and on 19 November 1976 the townsite was cancelled and the purpose of the reserve was changed to Conservation of Flora and Fauna, with vesting in the Shire of Wyalkatchem.

Discussions between the Shire of Wyalkatchem and the Departments of Fisheries and Wildlife, and Lands and Surveys led to the joint vesting of Nembudding, in WAWA and the Shire, on 1 July 1983.

3. SOILS AND VEGETATION

Two distinct soil types occur on Nembudding. Pale clay loams with varying proportions of sand, supporting eucalypt woodland, cover 60% of the reserve. The remaining 40%, or eastern part of Nembudding, carries clay with some laterite gravel and an associated Allocasuarina thicket.

The vegetation on Nembudding is distributed as shown in Figure 11, and described below:

1. Allocasuarina acutivalvis dominated Thicket, 3-4 m in height. There is negligible understorey.

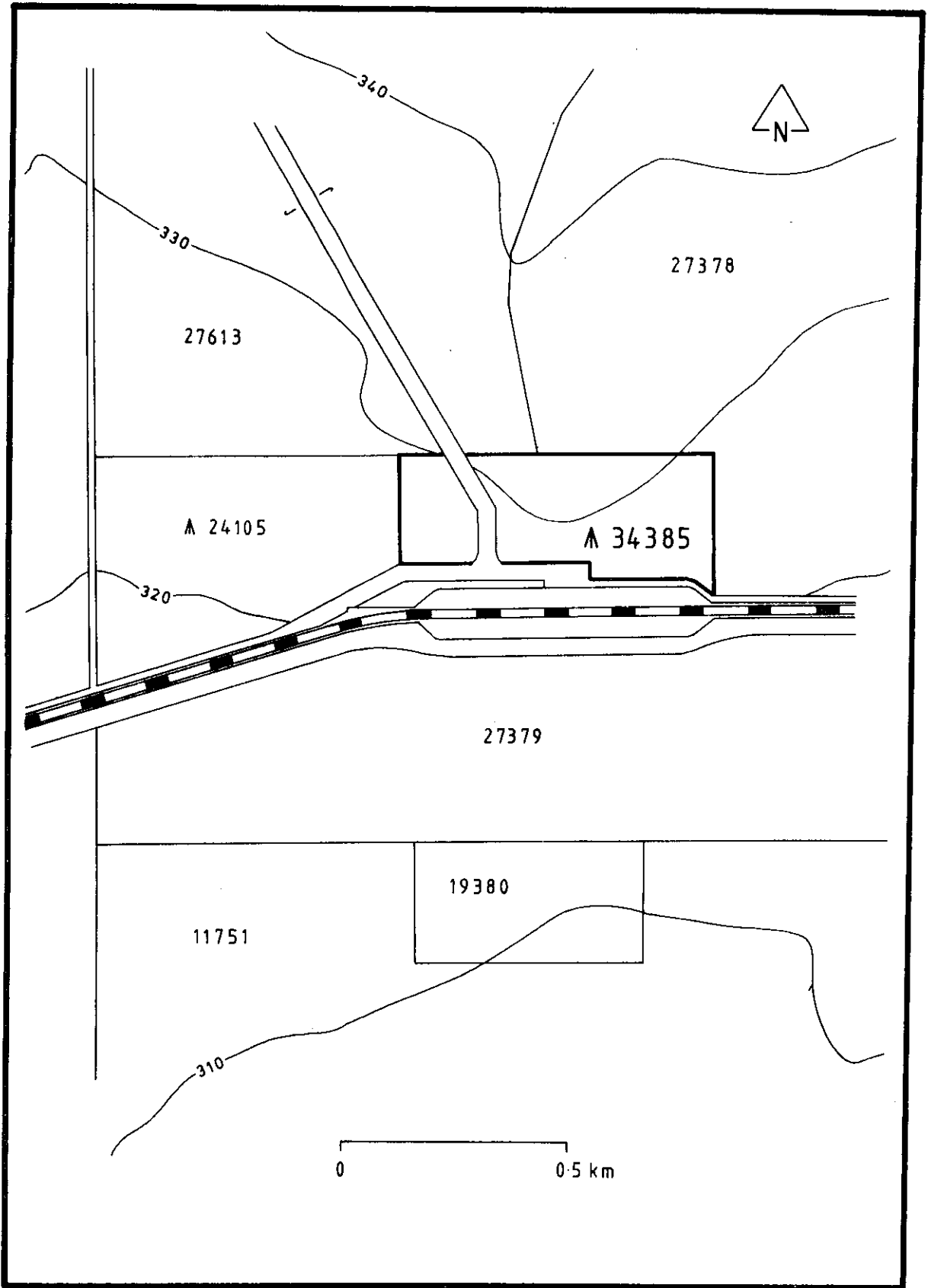


Figure 10. Nembudding Nature Reserve showing its relationship with surrounding lands and associated contours (m). (Source: Lands and Surveys 1:50 000 series.)

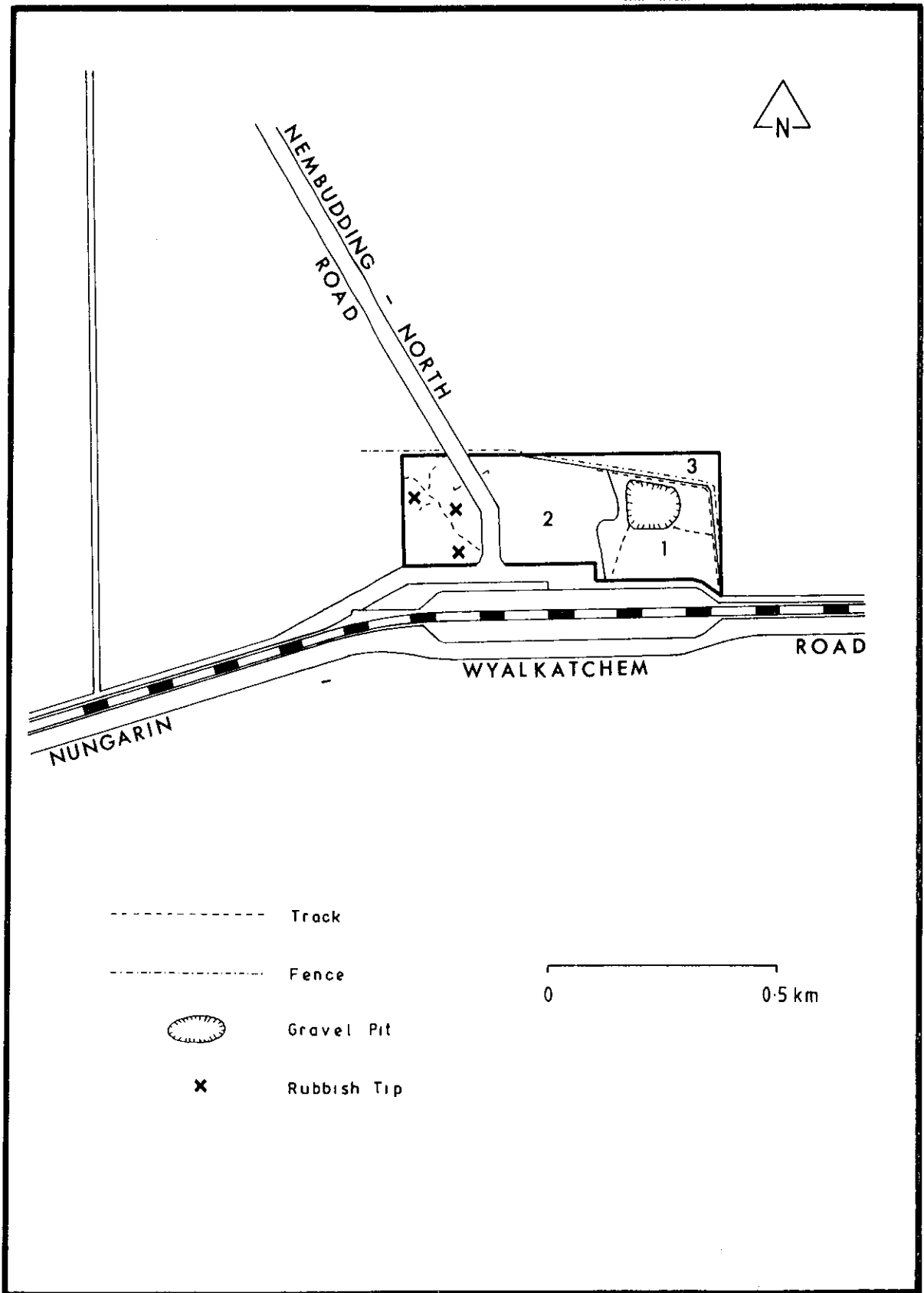


Figure 11. Nembudding Nature Reserve showing features and vegetation associations (identified by number and described in the associated text). (Source: Fisheries and Wildlife, 1984.)

2. Mallee/Open Mallee dominated by Red-flowered Mallee (Eucalyptus erythronema), E. myriadena, Black Marlock (E. redunca), Tall Sand Mallee (E. eremophila) and Redwood (E. transcontinentalis), 5-8 m in height. Occasional Salmon Gum (E. salmonophloia), Gimlet (E. salubris) and Wandoo (E. wandoo) emergent to 15-22 m. Scattered shrubs to 1 m of Acacia erinacea, Acacia hemiteles and Umbrella Bush (Melaleuca cardiophylla) are the only understorey.

3. Cleared, and under crop.

4. FAUNA

Twenty-five bird species have been recorded on Nembudding, all of which occur throughout the wheatbelt. Thus, Nembudding provides refuge for species that obviously survive in an agricultural landscape, but nonetheless require bushland for shelter and nesting. The presence of the Elegant Parrot is of particular interest, as it has only been recorded on the three woodland reserves with a significant component of Salmon Gum (Nembudding, Wyalkatchem and Korrelocking). The Salmon Gum woodland provides nest hollows for this species.

Nembudding is the only one of the Wyalkatchem nature reserves on which an Echidna was sighted during pre-planning surveys, although diggings were noted on several other reserves. Rabbits were also recorded.

5. PAST MANAGEMENT, USES AND FIRE HISTORY

Nembudding Nature Reserve has been subject to considerable degradation. At the eastern end of the reserve gravel deposits have been extensively mined to provide materials for road maintenance, and this has resulted in the loss of almost a third of the Allocasuarina acutivalvis association.

Rubbish dumping is the other highly noticeable past use. Truckloads of earth fill and other assorted debris cover the western third of the reserve. It seems likely that most of this originated from construction work on Nembudding Siding.

A less noticeable past use has been the function of the reserve as a holding area for stock, prior to loading and transport to market. Nembudding also provided a source of timber for fencing and farm buildings.

Many tracks traverse the reserve, particularly through the extensively rubbished western section. Two well developed tracks provide access to the gravel pits in the north-eastern corner. Perimeter tracks follow the eastern, and part of the northern boundary.

The northern and eastern sides of the reserve are fenced, with the northern fenceline cutting through the north-eastern corner (Fig. 11).

6. NATURE CONSERVATION VALUES

Nembudding Nature Reserve, although small and somewhat degraded, is important for a number of reasons. First, the stands of Allocasuarina acutivalvis provide a biological reference, in case the only other nature reserve with similar stands (Wyalkatchem Nature Reserve) is burnt or adversely affected by unforeseen management practices. Second, the eucalypt woodlands are quite diverse, with numerous hollows providing nests for parrots. Third, the reserve provides habitat for both resident and migratory birds. At the time of pre-planning surveys Tree Martins were nesting in the hollow limbs of some of the mature eucalypts, and White-fronted Chats had newly fledged young. Fourth, numerous Echidna diggings indicate that Nembudding supports a significant echidna population. Although no reptiles were recorded during the brief visit made to the reserve, the eucalypt woodland undoubtedly provides suitable habitat.

B. PLAN FOR MANAGEMENT

1. MANAGEMENT OBJECTIVES

Initially management will be directed towards rehabilitation of the reserve environment, and the associated and subsequent enhancement of its conservation values. Management is expected to be needed in the following areas during the course of operation of this plan:

Protection from Fire

To protect the assets of reserve neighbours, and the natural values of the reserve.

To minimise the occurrence of wildfires on the reserve and to suppress such wildfires as may occur.

Protection from Pests : Animal and Weed Control

To protect the reserve and surrounding farmlands from damage by plant and animal pests, particularly that which are declared from time to time under the provisions of the Agriculture and Related Resources Protection Act (1976, as amended).

Rehabilitation and Maintenance of the Natural Environment

To restore the area degraded by the dumping of earth fill and other construction materials.

To restore the area damaged by gravel extraction.

Public Use and Research

To maintain a conservative approach to use of the area by the public.

To monitor regeneration of the vegetation following rehabilitation.

2. PROTECTION FROM FIRE

Rationale

As with other nature reserves in the Shire, discussions between the Shire and reserve neighbours have verified that if the adjacent property is adequately firebreaked, there is no need to construct or maintain perimeter firebreaks on the reserve. Thus, the northern and eastern boundary tracks should be left to revegetate.

The road leading north from Nembudding Siding (Nembudding-North Road), divides the reserved land and thus provides a good internal break. Nembudding Bin Road, which separates the reserve from the railway, provides an excellent firebreak on the southern boundary.

Fire Suppression

Fire-fighting units from the Department of Fisheries and Wildlife at Wanneroo will, where possible (subject to the limitations of personnel and equipment), attend fires occurring on, or considered to be threatening, the reserve.

Adequacy of Control Measures

Special attention will be paid to the views of reserve neighbours and concerned local authorities in the matter of maintaining measures for fire protection. This plan provides for the individuals or groups affected to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the fire protection arrangements for the reserve.

Notifiable Authority

The Department of Fisheries and Wildlife shall be regarded as a Notifiable Authority in terms of the Bush Fires Act and Regulations (1954, as amended) in respect of the reserve.

3. PROTECTION FROM PESTS : ANIMAL AND WEED CONTROL

Control of pest animals and plants may be necessary from time to time to protect the reserve environment and its flora and fauna, and as part of organised pest control in the surrounding area. The necessary arrangements for organised control will be made by consultation and cooperation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

Adequacy of Control Measures

As with the provisions for fire protection, reserve neighbours or the local authority, or both, are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the control of pest plants and animals on the reserve. On receipt of such comments the Director may organise a joint inspection or take other action as may be needed to remedy the situation.

4. REHABILITATION AND MAINTENANCE OF THE NATURAL ENVIRONMENT

Rubbish Disposal

Removal of rubbish from the reserve will require earth-moving equipment, plus a significant input of labour. Most of the earthfill can be levelled and the rubbish buried. However, dumping has been so extensive that some rubbish may need to be removed from the reserve and disposed of elsewhere.

Rehabilitation of Gravel Pits

The extensive gravel pit in the north-eastern corner will be surface-ripped and the steep sides levelled as much as possible. Levelling may necessitate damage to a small area of Allocasuarina surrounding the pit. However, distribution of this debris over the pit area will spread seed, thereby encouraging widespread regeneration.

Closure of Tracks

The two access tracks to the gravel pit will be surface-ripped and closed to encourage regeneration and exclude vehicles.

Internal tracks, which are numerous in the heavily littered areas, will also be closed and surface-ripped to encourage regeneration of the vegetation.

5. PUBLIC USE AND RESEARCH

Nembudding has obviously been subjected in the past to considerable inappropriate public use. This has lowered the aesthetic appeal of an otherwise attractive reserve, with its mixture of Allocasuarina thicket and eucalypt woodland. Considering the degraded nature of the area and the need to enhance its conservation and aesthetic values, public use should remain conservative.

Signs

A sign giving the reserve name will be erected at the southern end of North Road. All signs used will conform with the signs standard of the Department of Fisheries and Wildlife, which is based on wooden routed signs with pale yellow lettering on an olive green background.

Research

Following the initial rehabilitation works, regeneration of the natural environment should be regularly monitored, primarily by photographic records.

A. THE RESERVE

1. PHYSICAL CHARACTERISTICS AND RELATIONSHIPS

Wyalkatchem, an irregularly shaped reserve with an area of 129.5 ha and a boundary length of about 5.3 km, is 3 km north-east of Wyalkatchem (Fig. 3). It is bordered to the north, south and east by gently undulating, cleared, privately owned farmland, typical of much of the central wheatbelt. A water supply reserve (No. 16623) and golf course abut the western boundary. The water supply reserve, with an area of 102.6 ha, is largely undisturbed.

Oldfields Road delineates the southern boundary of Wyalkatchem Nature Reserve, and a well maintained track follows the eastern boundary. The Perth-Koorda railway abuts the northern boundary. This line and the Perth-Koorda Road cut through the northern part of the water reserve. There is no firebreak or track delineating the boundary between the nature reserve and the water reserve.

The altitude within the reserve varies from 370 m in the north to 340 m in the south-east corner (Fig. 12). From here to Korrelocking Nature Reserve, 3 km to the east, the country remains undulating. However, Korrelocking is set slightly lower in the landscape, with an altitude range of 300 to 350 m.

2. HISTORY

Wyalkatchem Nature Reserve was originally part of an area set aside for Railways (Catchment-Water Supply) on 24 March 1920. An application for release of the reserve in July 1953 prompted the following response:

"The Board is strongly opposed to this area being made available for selection and requests that it be vested in the Board's control as a reserve for the Protection of Flora, if no longer required by the Railway Department for water supply purposes."

(Secretary of the Wyalkatchem Road, Health and Vermin Board in litt. to Under Secretary for Lands, Department of Lands and Surveys, 22 September 1953).

In November of the same year the local member, Mr G.M. Cornell, MLA, wrote to the Under Secretary for Lands expressing his support for the views held by the Wyalkatchem Road Board regarding the reserve. On 8 January 1954 the reserve was set aside for Protection of Flora, with vesting in the Wyalkatchem Road Board. In April 1970 the purpose of the adjacent railway (water supply) reserve was changed to Water Supply and vested in the Minister for Works, Public Works Department.

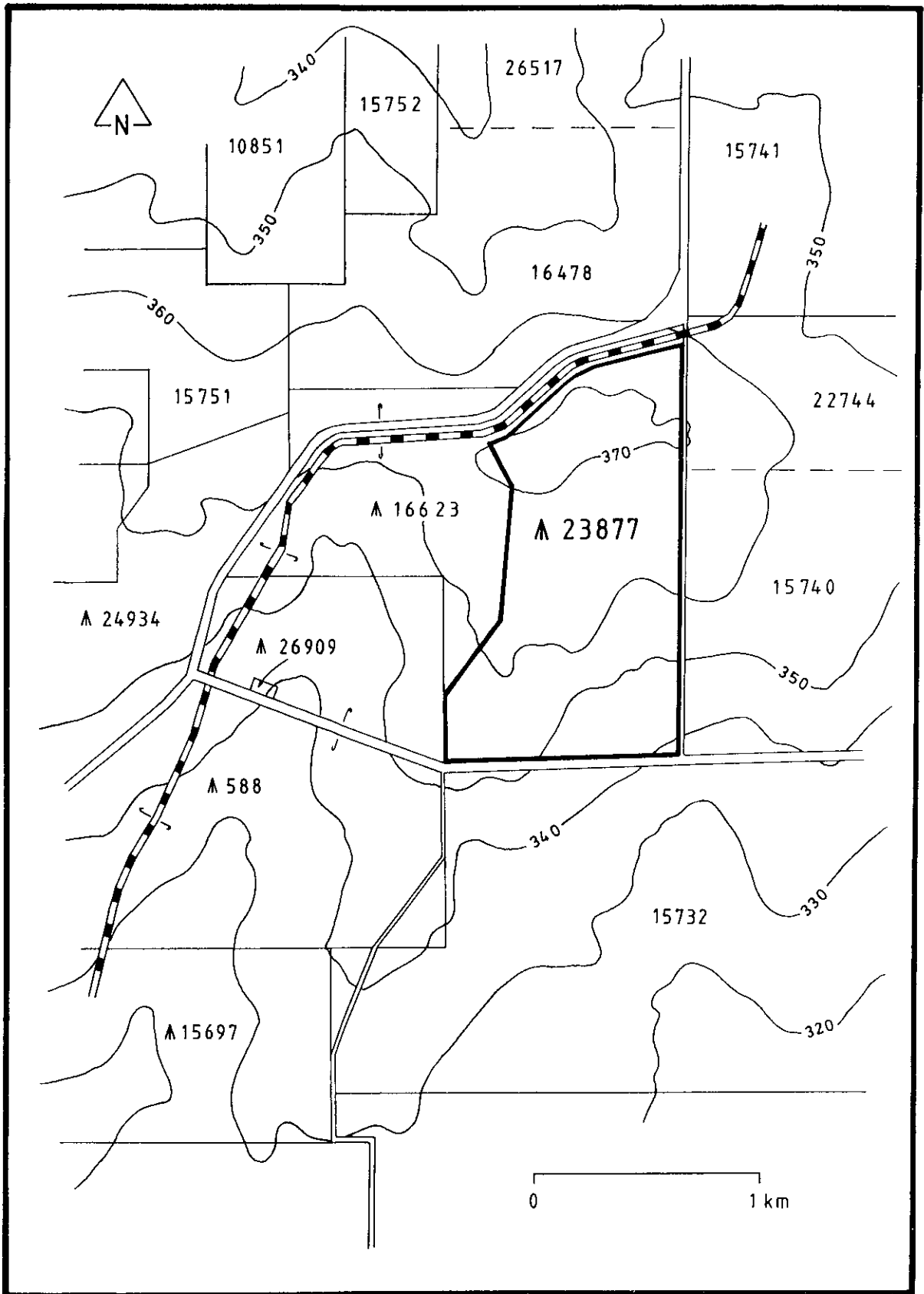


Figure 12. Wyalkatchem Nature Reserve showing its relationship with surrounding lands and associated contours (m). (Source: Lands and Surveys 1:50 000 series.)

Following discussions between the Shire of Wyalkatchem and the Departments of Fisheries and Wildlife, and Lands and Surveys, Wyalkatchem similarly to Korrelocking and Nembudding, was set aside for the Conservation of Flora and Fauna, with vesting in both WAWA and the Shire of Wyalkatchem, on 1 July 1983.

3. SOILS AND VEGETATION

The soils in this area (incorporating Reserve Nos. 23877 and 16623) readily separate into four types. Loams and clay loams support mallee woodland formations. Beneath the wandoo woodlands these become heavier clays. Pale sands and sandy loams are characteristic of the variable species-rich heathland. The fourth soil type is yellowish sand and lateritic gravel, which support a thicket of Sheoak (*Allocasuarina*).

The four vegetation formations can be divided into seven associations which are described below and distributed as shown in Figure 13.

1. Mixed Shrub Mallee/Tree Mallee, 5 - 8 m in height, dominated by Red-flowered Mallee (*Eucalyptus erythronema*), Gooseberry Mallee (*E. calycogona*) and Wandoo (*E. wandoo*), with occasional Salmon Gum (*E. salmonophloia*) and Gimlet (*E. salubris*), emergent to 15 m. The understorey is sparse, with occasional Dusk Daisy-bush (*Olearia muellerii*), *Acacia erinacea*, *Acacia hemiteles*, Umbrella Bush (*Melaleuca cardiophylla*), *Maireana georgei* and *Atriplex* sp.
2. *Allocasuarina acutivalvis* Thicket/Dense Thicket, to 4.5 m, with *Hakea scoparia*, Grass-leaved Hakea (*Hakea francisiana*), Broom Bush (*Melaleuca uncinata*) and *Grevillea* sp. also common. This association occurs over Low Sedges and occasional low shrubs such as Honeymyrtle (*Melaleuca conothamnoides*), Yellow Morrison (*Verticordia chrysantha*) and Painted Featherflower (*V. picta*). Burracoppin Mallee (*E. burracoppinensis*) is emergent to a metre or so over the Thicket.
3. Scrub/Open Scrub 2-3 m in height, of *Allocasuarina campestris*, *Allocasuarina acutivalvis*, *Leptospermum erubescens*, One-sided Bottlebrush (*Calothamnus quadrifidus*), and Broad-seeded Hakea (*Hakea platysperma*), over a species-rich Low Heath C/D including *Hakea incrassata*, Honeymyrtle, Yellow Morrison, Painted Featherflower, *Dryandra cirsioides*, *Beaufortia bracteosa*, *Melaleuca cordata* and *Beaufortia interstans*. Low Sedge occurs throughout and dominates many areas.
4. Thicket/Heath of *Allocasuarina campestris*, 2 m in height, with no understorey.

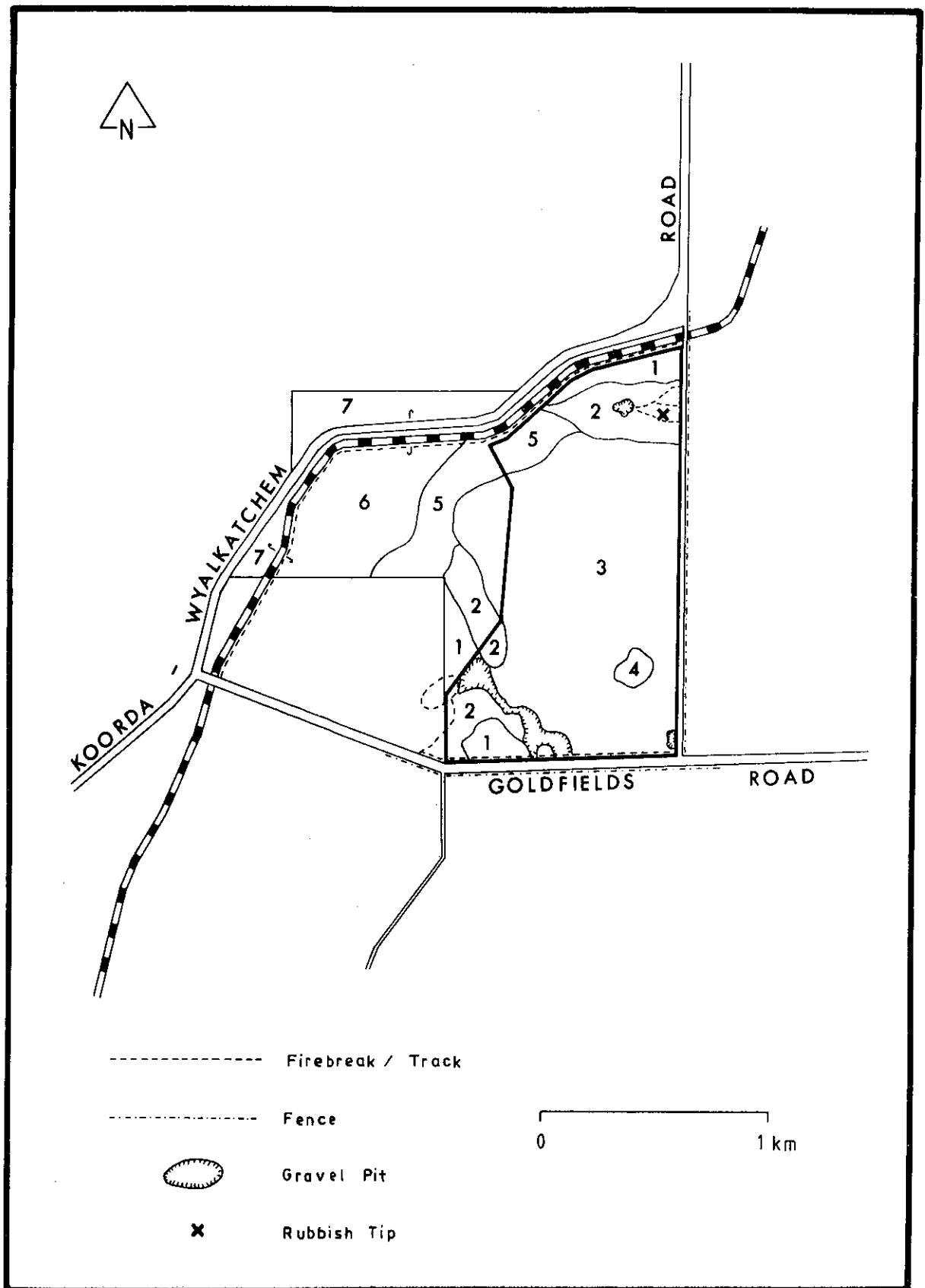


Figure 13. Wyalkatchem Nature Reserve showing features and vegetation associations (identified by number and described in the associated text). (Source: Fisheries and Wildlife, 1984.)

5. Broom Bush and Allocasuarina campestris dominated Thicket/Heath, 2-3 m in height, over Low Grasses and occasional Pincushions (Borya nitida).
6. Wandoo dominated Woodland, 15-18 m in height, with Snap-and-rattle (E. gracilis), Red-flowered Mallee, Redwood (E. transcontinentalis), E. myriadena and Salmon Gum significant components. This association occurs over Broom Bush and A. campestris Scrub over occasional shrubs of Acacia erinacea, over Low Grass and occasional Pincushions.
7. Open Tree Mallee/Open Shrub Mallee, 5-8 m in height, of Red-flowered Mallee, Gimlet, York Gum (E. loxophleba) and Fluted Horn Mallee (E. stowardii), over A. campestris and Broom Bush Thicket/Heath A, to 3 m, with Umbrella Bush, 1.5 m in height, in places. Scattered emergent Salmon Gum and Wandoo are also present.

4. FAUNA

Pre-planning surveys have recorded forty-two species of bird on Wyalkatchem Nature Reserve. Therefore, Wyalkatchem is second only to Korrelocking in number of bird species recorded. Of particular interest is the large number of honeyeaters - five of the nine species recorded on the Wyalkatchem nature reserves are found on Wyalkatchem. Of these, the Black Honeyeater has not been recorded on any other nature reserve within the Shire. It appears as if the combination of variable mallee and diverse heathlands provides a year-round source of nectar, creating ideal habitat.

These woodlands also provide valuable habitat for Horsefield's Bronze Cuckoo, a migratory species that has been recorded on only one other reserve in the Shire, Korrelocking. Finally, Wyalkatchem is the only reserve on which the White-backed Swallow, the only Australian swallow that nests in ground-burrows, has been recorded.

The only other signs of animals noted during pre-planning surveys were fox tracks and Echidna diggings.

Similarly to other nature reserves in the Shire, systematic surveys of the fauna of Wyalkatchem Nature Reserve have not been carried out, and hence no conclusions can be drawn as to its faunistic values.

5. PAST MANAGEMENT, USES AND FIRE HISTORY

Both Wyalkatchem Nature Reserve and the adjacent water supply reserve are relatively undisturbed, considering their close proximity to Wyalkatchem townsite. However, the nature reserve has been subjected to some inappropriate use.

In the past the most obvious form of use has been gravel and sand removal. Lateritic gravel has been removed from

a pit in the north-eastern corner of the reserve, and considerable quantities of rubbish have been dumped in the pit. Gravel has also been removed from the south-western corner. In the north-western corner the scar still remains from an extensive gravel scrape, although it has now largely regenerated. Sand has been removed from pits in the south-eastern and south-western corners. Although there are few signs of timber removal in the mallee woodland areas, the Wandoo woodlands appear to have been extensively cut over.

The final form of use pressure is shared with the adjacent golf course. At the southern end of the common boundary between the golf course and nature reserve motor-cycle enthusiasts use a small race circuit in part of a disused gravel pit.

Neither the nature reserve nor the water supply reserve appear to have been burnt for many years. Fire protection has been limited in the past to the construction and maintenance of firebreaks along the eastern and southern boundaries. A firebreak separating the railway and the reserve has been maintained along the northern boundary. Fences follow the eastern boundary of the nature reserve, and the northern and western boundaries of the water supply reserve.

6. NATURE CONSERVATION VALUES

Not only is Wyalkatchem Nature Reserve of significant size, it also contains a diversity of habitats. These habitats support an associated diversity of bird species, varying from the Spotted Harrier, to Bee-eaters, to Crimson and White-fronted Chats. As mentioned earlier, the combination of diverse eucalypt woodland and heath provides a consistent food source for at least five species of honeyeater. The eucalypt woodlands also provide numerous sites for hollow-nesting birds. The species-rich heathland (Association 3, Fig. 13) which covers four-fifths of the reserve, is a poorly conserved habitat in the wheatbelt. As well as being of botanical interest, it provides nesting sites and refuge for a number of passerine birds, including White-fronted Honeyeaters and Crimson Chats, both of which had fledglings at the time of survey. Tall dense thickets dominated by *Allocasuarina* provide excellent refuge for both passerine and non-passerine bird species.

Two other values deserve a mention. First, although no trapping program has been implemented, it is expected that lizards and snakes would be relatively abundant in the mallee-dominated formations at least. Second, the *Allocasuarina*-*Leptospermum*-*Calothamnus*-*Hakea* dominated heath provides a spectacular wildflower show in spring, ideal for enjoyment by photographers and wildflower enthusiasts alike.

B. PLAN FOR MANAGEMENT

1. MANAGEMENT OBJECTIVES

Management of Wyalkatchem Nature Reserve will be directed towards the enhancement and maintenance of its conservation values. Management for public use is an important secondary consideration. During the course of operation of this plan, management is expected to be required in the following fields:

Protection from Fire

To protect the assets of reserve neighbours, and the natural values of the reserve.

To minimise the occurrence of wildfires on the reserve and to suppress such wildfires as may occur.

Protection from Pests: Animal and Weed Control

To protect the reserve and surrounding farmlands from damage by plant and animal pests, particularly those that are declared from time to time under the provisions of the Agriculture and Related Resources Protection Act (1976, as amended).

Rehabilitation and Maintenance of the Natural Environment

To restore areas degraded by rubbish dumping, gravel removal, and the activities of off-road vehicles. To minimise further weed invasion into the reserve.

Public Use and Research

To consider use of the reserve for nature study as an important function, complementing the conservation values of the area.

To monitor regeneration, following rehabilitation of areas degraded by gravel mining.

2. PROTECTION FROM FIRE

Rationale

This reserve, in association with the Water Reserve and golf course, is surrounded by cleared agricultural land. Thus there is little chance of fire spreading onto the reserve from clearing burns. However, there is some likelihood of fire beginning adjacent to the railway. Thus, adequate fire protection is essential. This is best achieved by the continued maintenance of strategic firebreaks.

Firebreak Maintenance

As with other nature reserves in the Shire, discussions

between the Shire Council and reserve neighbours have led to the realisation that there is no need to construct or maintain firebreaks on the reserves where adequate firebreaks can be maintained on abutting properties. Therefore, the firebreaks along the southern and eastern boundaries should be allowed to fall into disuse. However, the firebreak adjacent to the Wyalkatchem - Koorda railway should be regularly maintained.

Protective Burning

Wyalkatchem Nature Reserve and the adjacent water reserve have not been burnt for many years. Thus, history suggests that this combination of areas of scrub and heath separated by open mallee has a low susceptibility to fire. Therefore a protective burning programme is unnecessary.

Fire Suppression

Fire-fighting units from the Department of Fisheries and Wildlife at Wanneroo will, where possible (subject to the limitations of personnel and equipment), attend fires occurring on the reserve, or considered to be threatening it.

Adequacy of Control Measures

Special attention will be paid to the views of reserve neighbours and concerned local authorities in the matter of maintaining measures for fire protection. This plan provides for the individuals or groups affected to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the fire protection arrangements for the reserve.

Notifiable Authority

The Department of Fisheries and Wildlife shall be regarded as a Notifiable Authority in terms of the Bush Fires Act and Regulations (1954, as amended) in respect of the reserve.

3. PROTECTION FROM PESTS : ANIMAL AND WEED CONTROL

Control of pest animals and plants may be necessary from time to time to protect the reserve environment and its flora and fauna, and as part of organised pest control in the surrounding area. The necessary arrangements for organised control will be made by consultation and cooperation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

Adequacy of Control Measures

As with the provisions for fire protection, reserve neighbours or the local authority, or both, are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to inadequacies they perceive in

the control of pest plants and animals on the reserve. On receipt of such comments the Director may organise a joint inspection or take other action as may be needed to remedy the situation.

4. REHABILITATION AND MAINTENANCE OF THE NATURAL ENVIRONMENT

Rubbish

The rubbish dumped in the gravel pit in the north-eastern corner of the reserve will be buried in the centre of the pit, using the surrounding steep banks as fill.

Rehabilitation of Gravel Pits

As mentioned above the steep sides of the gravel pit in the north-eastern corner will be used to partially fill the pit and reduce the steepness of the pit contours. Surrounding piles of topsoil, pushed to the side during earlier works, will be spread over the area. This will increase the damaged area by about a fifth, however, it will hasten regeneration by spreading seed and relatively fertile topsoil over the area. Similarly, the gravel pits in the south-western and south-eastern corners should be roughly levelled. All rehabilitated pit areas, plus access tracks, should be surface-ripped to encourage regeneration.

It may be necessary to fence off part or all of the south-western gravel pits to allow regeneration to occur in an undisturbed environment.

Weeds

Some invasion by weed species is occurring in the area around the northern gravel pit, and along the eastern boundary. If, however, disturbance to the body of the reserve is minimised, no significant increase in weeds should occur.

5. PUBLIC USE AND RESEARCH

Wyalkatchem Nature Reserve plays an important role in providing for public use. Its ready accessibility and close proximity to Wyalkatchem, plus the diversity of habitats, attractive woodlands and diversity of birdlife make it ideal for bushwalking, wildflower study and bird watching. Also, its undisturbed environment complements the more intensively used golf course to the south-west.

Access

Since this nature reserve is near Wyalkatchem townsite and is susceptible to damage by off-road vehicles, its conservation values and high values as an education resource are best protected by classifying the area as a LIMITED ACCESS AREA under Section 12A of the Wildlife conservation Act (1950, as amended). This will allow

access to all parts of the reserve on foot, limiting motor vehicles to the northern and southern boundary roads.

Signs

Signs will be erected on the north and south-western corners, giving the name of, and details of access for, the reserve. These will be designed and constructed according to the signs standard for the Department of Fisheries and Wildlife. This is based on wooden routed signs, with pale yellow lettering on an olive green background.

Research

Regular monitoring of the rehabilitated gravel pits is suggested during the currency of this plan.

PART 8 : CARRIBIN NATURE RESERVE (NO. 10991)

A. THE RESERVE

1. PHYSICAL CHARACTERISTICS AND RELATIONSHIPS

Carribin, a rectangular nature reserve with its longer axis lying north-south, covers an area of 22.7 ha and has a perimeter of about 2 km (Fig. 14). It is 22 km south-south-east of Wyalkatchem and 31 km north of Tammin, and is surrounded by cleared, privately owned farmland. The closest made road, Parsons Road, is 900 m to the west, and runs parallel to the western boundary of the reserve.

The northern half of the reserve is dominated by a large granite hillside. A soak at the southern, lower edge of this slope is the source of a small seasonal watercourse that drains southwards. The variation in altitude from 300 m on the northern boundary, to 280 m in the south-eastern corner, is significant in such a small area.

2. HISTORY

This reserve was originally set aside on 25 October 1907 for Water. In 1909 its area was increased to 1032 acres, and then decreased to 112 acres in 1910. The remaining 920 acres was thrown open for selection. Over the next four decades various applications were made for the release of the remaining reserved area. On 2 March 1956 the Assistant Divisional Surveyor (in litt. to the Surveyor General, Department of Lands and Surveys) noted that Carribin Rock...

"...at present provides an ideal potential water supply catchment and shelter for birdlife.... would now recommend that.... the purpose of the reserve be changed from Water to Flora and Fauna."

Thus, on 11 May 1956 the purpose was changed to Flora and Fauna.

Following correspondence between the Director (Department of Fisheries and Wildlife) and the Under Secretary for Lands (Department of Lands and Surveys) in late 1969, Carribin was vested in WAWA on 28 August 1970.

3. SOILS AND VEGETATION

Soils on the reserve are sandy loams, with some accumulation of sand round the base of the granite outcrops.

The vegetation can be divided in five distinct associations, all of which have been severely affected by stock. These are described below and distributed as shown in Figure 15.

1. Allocasuarina campestris Thicket, 2-3 m in height, over dry Low Grass.

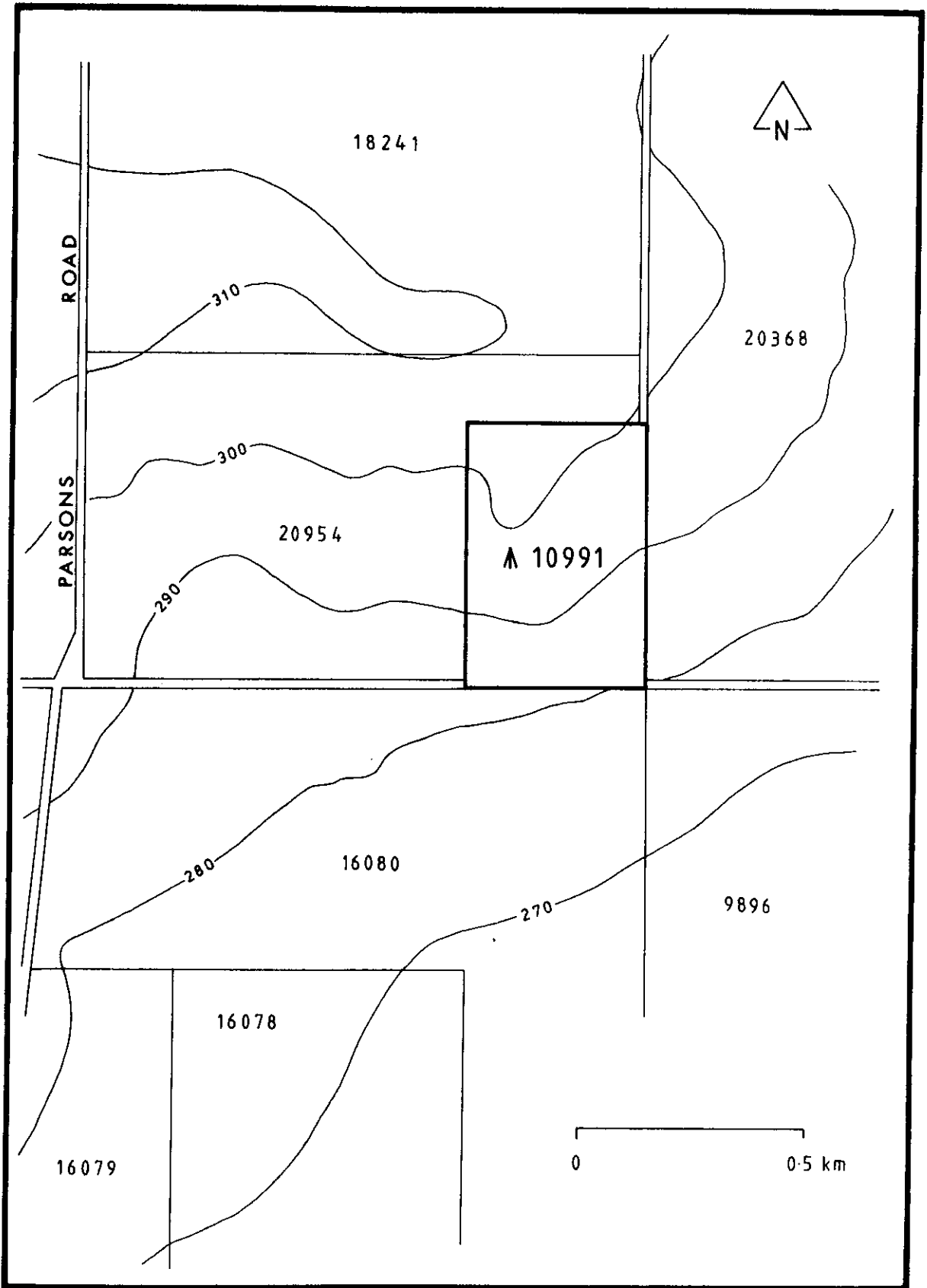


Figure 14. Carribin Nature Reserve showing its relationship with surrounding lands and associated contours (m). (Source: Lands and Surveys 1:50 000 series.)

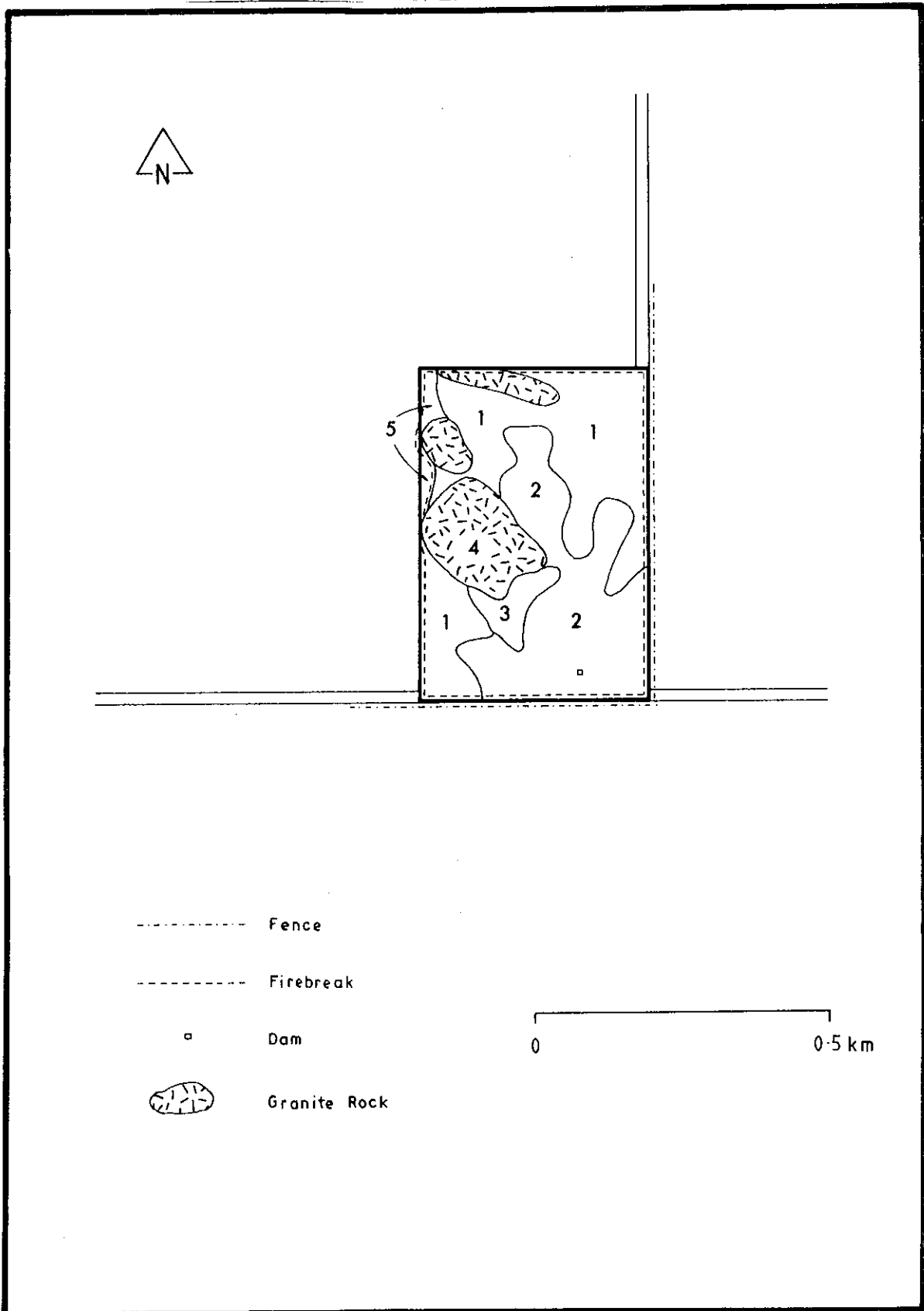


Figure 15. Carribin Nature Reserve showing features and vegetation associations (identified by number and described in the associated text). (Source: Fisheries and Wildlife, 1984.)

2. Jam (Acacia acuminata) Open Low Woodland, 8-10 m in height, over Low Grass.
3. York Gum (Eucalyptus loxophleba) and Jam Low Woodland, 10-14 m in height, over Thicket/Dense Thicket to 4 m, of Leptospermum erubescens, Allocasuarina acutivalvis and A. campestris. This association occurs round the soak.
4. Open expanses of sheet granite and granite boulders. Acacia lasiocalyx, Allocasuarina campestris and Sandalwood (Santalum spicatum) occur wherever sufficient soil is available. Granite Kunzea (Kunzea pulchella) occurs in cracks on the exposed granite surfaces.
5. Low Grass.

4. FAUNA

Twenty eight species of bird are found on this small reserve. This large number (for a reserve of only 22.7 ha) is a function of the diversity of habitat and food sources offered by the granite rock community and freshwater soak. This is the only nature reserve within the Shire on which the Banded Lapwing and Crested Bellbird have been recorded. These species are widely distributed throughout the wheatbelt, and their presence on Carribin indicates that the reserve carries a small representative sample of wheatbelt birdlife.

No reptiles or mammals (apart from rabbits), were recorded on the reserve during pre-planning surveys.

Similarly to other nature reserves in the Shire, systematic surveys of the fauna of this reserve have not been carried out, and hence no conclusions can be drawn as to its faunistic values.

5. PAST MANAGEMENT, USES AND FIRE HISTORY

Carribin has been subject to considerable abuse by stock. Much of the vegetation, particularly the understorey, is very degraded and is dominated by grasses. Early reports of the flora of the reserve (from a survey carried out on 1 September 1956 by members of the Fauna Protection Advisory Committee) mention Dryandra and Calothamnus species; these are now absent.

The granite rock-faces have suffered from trampling and disturbance by stock, with a resultant decrease in value as reptile habitat. The south-eastern corner has been disturbed by the construction of a dam on the southern boundary. This has led to increased grazing pressure on the Jam woodland adjacent to and north of the dam, and increased use of the granite rock and soak environment for shelter and shade.

Timber has been removed in the past from Carribin. There are, however, no recent signs of this activity.

Firebreaks are maintained round the perimeter of the reserve. The southern and eastern, but not the northern and western, boundaries are fenced. Therefore, Carribin is effectively part of adjoining Avon Location 20954.

From early aerial photographs, and from ground survey, it appears that the reserve has not been burnt for many years. There is, however, correspondence between the Fauna Warden and Fauna Protection Officer (Department of Fisheries and Wildlife, July 1962) that mentions the occurrence of a small fire -

"The private land adjoining this reserve has been recently cleared. Apparently the persons that cleared the land camped at the soak, and had their camp burnt out, and approximately 10 acres of the reserve".

6. NATURE CONSERVATION VALUES

Unfortunately the conservation values of Carribin have been reduced by stock pressures over the last 80 to 100 years. However, this area does provide refuge for a diversity of local birds, both sedentary and nomadic. During October 1981 Black-faced Woodswallows were nesting in the Sandalwood among the rocks, and Crimson Chats had fledging young. In addition, as mentioned earlier, this is the only reserve in the Shire with records of the widely distributed Crested Bellbird and Banded Lapwing.

Once stock are excluded from the reserve the rocky faces will become more suitable for reptiles, as rock piles develop and physical disturbance is minimised. Stock exclusion will also encourage the understorey to regenerate, and this will provide additional habitat.

The reserve is aesthetically pleasing with its granite faces and twisted shrubs and Sandalwood. The variety of birdlife it supports also adds to its appeal. Although the area has been extensively disturbed by stock it still protects an important, though temporary, source of water for native fauna. Another attractive feature of the reserve is its freedom from rubbish.

B. PLAN FOR MANAGEMENT

1. MANAGEMENT OBJECTIVES

The primary objective of management for Carribin will be to enhance and retain its natural values. Active management is expected to be needed in the following fields during the course of operation of this plan:

Protection from Fire

To protect the assets of reserve neighbours, and the natural values of the reserve.

To minimise the occurrence of wildfires on the reserve and to suppress such wildfires as may occur.

Protection from Pests : Animal and Weed Control

To protect the reserve and surrounding farmlands from damage by plant and animal pests, particularly those that are declared from time to time under the provisions of the Agriculture and Related Resources Protection Act (1976, as amended).

Rehabilitation and Maintenance of the Natural Environment

To restore the natural environment, which has been damaged by continued stock grazing.

Public Use and Research

To maintain a conservative approach to public use, and to encourage research following the exclusion of stock.

2. PROTECTION FROM FIRE

Rationale

Carribin, a small reserve in the midst of cleared farmland, with extensive natural firebreaks (granite rock-surfaces cover a fifth of the total reserve area) and a complete perimeter firebreak, presents little fire risk to the adjacent landholder. Thus no additional fire protection is needed.

Fire Suppression

Fire-fighting units from the Department of Fisheries and Wildlife at Wanneroo will, where possible (subject to the limitations of personnel and equipment), attend fires occurring on the reserve, or considered to be threatening it.

Adequacy of Control Measures

Special attention will be paid to the views of reserve neighbours and concerned local authorities in the matter

of maintaining measures for fire protection. Through this plan formal provision is made for the individuals or groups affected to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the fire protection arrangements for the reserve.

Notifiable Authority

The Department of Fisheries and Wildlife shall be regarded as a Notifiable Authority in terms of the Bush Fires Act and Regulations (1954, as amended) in respect of the reserve.

3. PROTECTION FROM PESTS : ANIMAL AND WEED CONTROL

Control of pest animals and plants may be necessary from time to time to protect the reserve environment and its flora and fauna, and as part of organised pest control in the surrounding area. The necessary arrangements for organised control will be made by consultation and cooperation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

Adequacy of Control Measures

As with the provisions for fire protection, reserve neighbours or the local authority, or both, are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the control of pest plants and animals on the reserve. On receipt of such comments the Director may organise a joint inspection or take other action as may be needed to remedy the situation.

4. REHABILITATION AND MAINTENANCE OF THE NATURAL ENVIRONMENT

Fencing and Access

There is an immediate need for the adjacent landholder to fence the northern and western boundaries of the reserve to exclude stock. To allow access to the reserve by officers of the Agriculture Protection Board and the Department of Fisheries and Wildlife, a gate should be placed in one of the fencelines.

5. PUBLIC USE AND RESEARCH

Public use of the area should remain negligible. This conservative approach is most suitable considering the complete isolation of Carribin amidst privately owned farmland.

Signs

A sign identifying the reserve by name will be erected near the access gate. The sign will comply with the signs standard for the Department of Fisheries and Wildlife,

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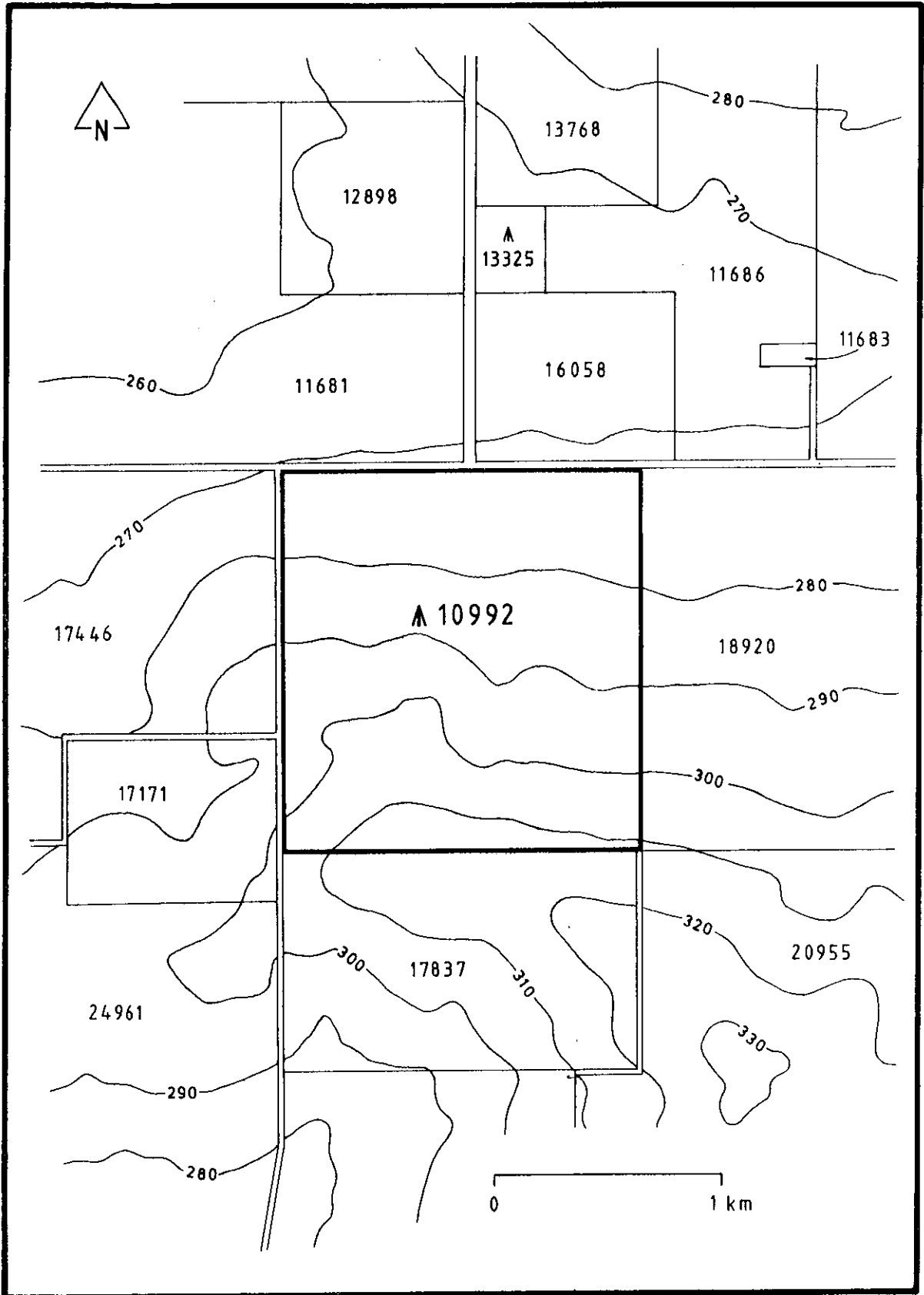


Figure 16. Elashgin Nature Reserve showing its relationship with surrounding lands and associated contours (m). (Source: Lands and Surveys 1:50 000 series.)

The values of this reserve continued to be recognised and in February 1960 the Wyalkatchem Road Board requested that the area be vested in the Board, for the purpose of Picnic Ground and Conservation of Flora and Fauna. Elashgin was set aside for this purpose, with vesting in the Road Board, on 2 December 1960. On 1 July 1983, similarly to Korrelocking, Wyalkatchem and Nembudding, Elashgin was jointly vested in WAWA and the Shire of Wyalkatchem for the Conservation of Flora and Fauna.

3. SOILS AND VEGETATION

Elashgin is characterised by loams and sandy loams, with extensive areas of outcropping granite, particularly in the central and southern parts. These soils support a range of vegetation types, which although they intergrade and have poorly defined boundaries, can be divided into four associations. The dominant association, of Allocasuarina and Melaleuca, occupies three-quarters of the area of the reserve. Probably another fifth of the reserve is covered by Jam open woodland, which grades into the third formation - limited areas of York Gum low woodland. The fourth association is dominated by rocky outcrops between which small stands of Allocasuarina and Acacia lasiocalyx appear, with the spectacular red-flowered Granite Kunzea (Kunzea pulchella) growing from narrow crevices in the sheet rock. The four associations are distributed as shown in Figure 17 and may be described as follows:

1. Allocasuarina campestris and Melaleuca uncinata dominated Thicket/Heath A, 2.0-2.5 m in height, with Melaleuca adnata, M. radula, Acacia hemiteles and Sweet Quandong (Santalum acuminatum) also present. Open Shrub Mallee to 5 m is occasionally present. Where this association abuts granite outcrops, Allocasuarina campestris often forms Dense Thicket, to 3 m in height.
2. Granite-rock complex. The granite surfaces support mosses and lichens. An occasional Granite Kunzea (Kunzea pulchella), growing from narrow cracks in the rock, is emergent to 2 m. In pockets of shallow soil Pincushions (Borya nitida) are the common ground cover. Isolated stands of Sheoak (Allocasuarina huegeliana) to 12 m, and Acacia lasiocalyx to 10 m, are also a component of this complex.
3. York Gum (Eucalyptus loxophleba) Low Woodland, 12-15 m in height, occasionally with a low mallee component. The understorey is variable, characteristic species being Jam, Allocasuarina campestris, Leafless Ballarat (Exocarpus aphylla), Dusk Daisybush (Olearia muelleri) and Hakea sp.
4. Jam Low Woodland, 4-8 m in height, over Low Grass and Pincushions (Borya nitida). Scattered York Gums are occasionally emergent to 5 m.

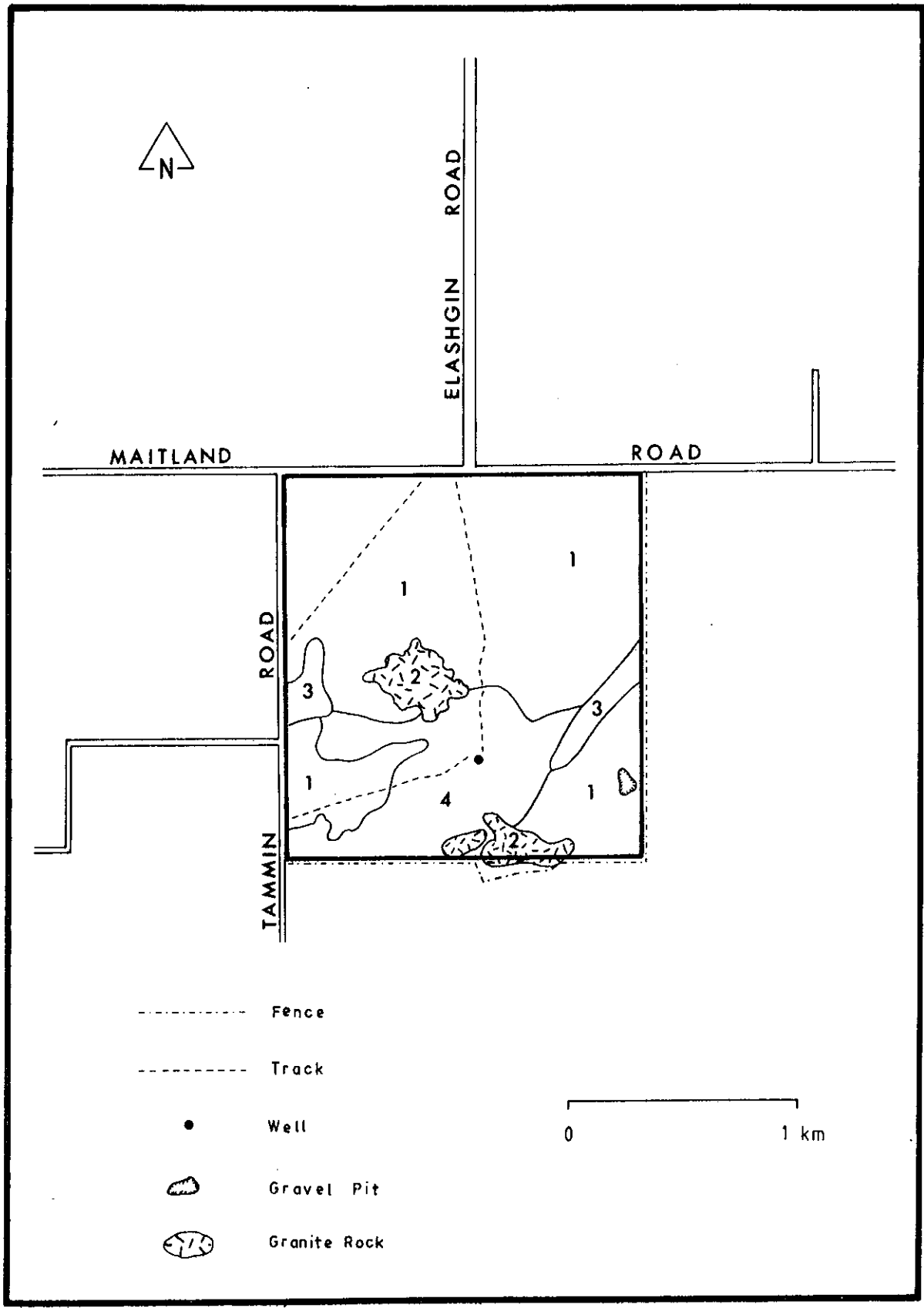


Figure 17. Elashgin Nature Reserve showing features and vegetation associations (identified by number and described in the associated text). (Source: Fisheries and Wildlife, 1984.)

The heath and woodland described above are highly variable, and future detailed examination will no doubt increase the number of association descriptions.

4. FAUNA

The 39 bird species recorded on Elashgin is the third highest number recorded, during pre-planning surveys, on the Wyalkatchem nature reserves. Of the nine honeyeaters recorded on nature reserves within the Shire, five occur on Elashgin, with two of these, the Red Wattlebird and White-eared Honeyeater, having been recorded on no other Wyalkatchem nature reserve. The record of the White-eared Honeyeater is of particular interest, as this species usually occurs further to the east in open forest, mallee and heath. Also of special interest is the Dusky Woodswallow, a bird whose range is now much reduced because of competition from the Black-faced Woodswallow. This species is now rarely met north of Wagin. However, at times it may still wander towards the northern limits of its former range (Serventy and Whittell, 1976).

Two species of large kangaroo have been sighted on the reserve, the Western Grey Kangaroo (Macropus fuliginosus) and Euro (M. robustus). Local land owners have reported seeing Echidnas (Tachyglossus aculeatus) on the reserve. Rabbits and foxes have also been recorded.

4. PAST MANAGEMENT, USES AND FIRE HISTORY

Elashgin has been subject to varying degrees of human usage from the time of first settlement. Signs of early use of the reserve still remain in the form of an old track leading to Elashgin Soak. This faint track, which runs along the northern edge of one of the large granite outcrops on the southern boundary, still shows the narrow three-grooved tracks made by horse-drawn sulkies.

Several other vehicle tracks persist on the reserve. One of these traverses the reserve from the south-western corner, via Elashgin Soak, to the centre of the northern boundary. This track provides access for picnickers, but from its overgrown condition is apparently little used. Another overgrown track cuts through the north-western corner.

Elashgin Nature Reserve has a rubbish problem, a problem shared with several other nature reserves in the Shire, and with many other nature reserves throughout the wheatbelt. On Elashgin farm materials, bottles and cans have been dumped, particularly on the gravel scrape in the south-eastern corner.

Another past use has been gravel extraction, and the gravel scrape in the south-eastern corner is indicative of this past pressure.

The reserve has experienced a low incidence of fire, with the only fire in living memory being one which, 30 years

ago, burnt a small area round the soak (Mr H.H. Maitland, reserve neighbour, pers. comm., 1981). This fire burnt itself out against the base of the central rock outcrop. From 1972 aerial photographs of the reserve there appears to be an old fire scar on the northern side of the central granite outcrop. However, the age and origin of this scar are unknown.

To date there has been little management input into the reserve. The surrounding farmland is fenced, and regularly maintained firebreaks follow paddock boundaries that abut the reserve. The gravel roads on the northern and western boundaries of the reserve also provide excellent firebreaks.

6. NATURE CONSERVATION VALUES

Elashgin is one of the two largest nature reserves in the Shire, the other being Korrelocking. Both reserves support many different habitats - on Elashgin these vary from mallee and tree eucalypts, to Allocasuarina and Melaleuca heath and thicket, to Jam low woodland. The largely undisturbed granite complexes in the central and southern part of Elashgin add further to this diversity.

No comprehensive mammal or reptile trapping programmes have been implemented on the reserve. However, the size, compact shape, diversity of habitat and long freedom from fire should provide an ideal environment for a wide range of reptile and small mammal species. Further surveys of bird populations on the reserve would significantly increase the number of bird species recorded.

Another obvious value of the reserve is the pleasant environment created by relatively undisturbed vegetation and attractive granite outcrops. Orchids are numerous during the spring months, and this adds further to the visual attractions of the reserve.

The soak and stone-lined well are historically interesting, particularly as they were the primary reason for early protection of the reserve, during the early days of pastoral and agricultural expansion. These water points, plus "gnamma" holes in the granite rocks, are important sources of semi-permanent water for local wildlife.

B. PLAN FOR MANAGEMENT

1. MANAGEMENT OBJECTIVES

Management will be directed towards enhancing and maintaining the nature conservation values of Elashgin Nature Reserve. The ready accessibility of the reserve, and its presence as the only large area of reserved land in the southern half of the Shire, mean that it is likely to experience some degree of public use. Any use, however, should be compatible with management for the protection of the nature conservation values of the area.

The following management needs are visualised during the currency of this plan:

Protection from Fire

To protect the assets of reserve neighbours, and at the same time protect the natural values of the reserve.

To minimise the risk of occurrence of wildfires on the reserve and to suppress such wildfires as may occur.

Protection from Pests : Animals and Weed Control

To protect the reserve and surrounding farmlands from damage by plant and animal pests, particularly those that are declared from time to time under the provisions of the Agriculture and Related Resources Protection Act (1976, as amended).

Rehabilitation and Maintenance of the Natural Environment

To restore areas used for gravel extraction and to remove rubbish from the reserve.

To encourage the continuing natural regeneration of other tracks within the reserve.

Public use

To encourage public use of the reserve, provided that use remains compatible with the primary purpose of Elashgin: that of nature conservation.

2. PROTECTION FROM FIRE

Rationale

Similarly to most other reserves in the Shire, Elashgin is isolated amidst cleared agricultural land. This isolation, and the extensive areas of granite outcrops, reduces the likelihood of fire originating on, moving onto, or moving through the reserve. Historical records indicate that Elashgin has not sustained an extensive fire for at least 30 years, confirming that the area presents little fire risk.

The gravel roads on the northern and western boundaries provide excellent firebreaks. On the eastern and southern boundaries, reserve neighbours E. and H. Maitland are completely satisfied with the existing situation - boundary breaks on their farmland where it abuts the reserve. Thus, although no firebreaks have been constructed on the reserve, all four reserve boundaries have firebreaks, either in the form of gravel roads, or farm firebreaks directly adjacent the reserve. The absence of firebreaks on the southern and eastern boundaries enhances the conservation values of the reserve by minimising access to areas that are little disturbed.

Therefore the existing fire protection measures are adequate.

Fire Suppression

Fire-fighting units from the Department of Fisheries and Wildlife at Wanneroo will, where possible (subject to the limitations of personnel and equipment), attend fires occurring on the reserve, or considered to be threatening it.

Adequacy of Control Measures

Special attention will be paid to the views of reserve neighbours and concerned local authorities in the matter of maintaining measures for fire protection. This plan provides for the individuals or groups affected to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive in the fire protection arrangements for the reserve.

Notifiable Authority

The Department of Fisheries and Wildlife shall be regarded as a Notifiable Authority in terms of the Bush Fires Act and Regulations (1954, as amended) in respect of the reserve.

3. PROTECTION FROM PESTS : ANIMAL AND WEED CONTROL

Control of pest animals and plants may be necessary from time to time to protect the reserve environment and its flora and fauna, and as part of organised pest control in the surrounding area. The necessary arrangements for organised control will be made by consultation and cooperation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

Adequacy of Control Measures

As with the provisions for fire protection, reserve neighbours or the local authority, or both, are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to the inadequacies they perceive

in the control of pest plants and animals on the reserve. On receipt of such comments the Director may organise a joint inspection or take other action as may be needed to remedy the situation.

4. REHABILITATION AND MAINTENANCE OF THE NATURAL ENVIRONMENT

Rubbish Removal and Rehabilitation of Gravel Pits

The rubbish in the gravel scrape in the south-eastern corner will be removed and the scrape surface-ripped to encourage regeneration.

Closure of Tracks

The track running from the centre of the northern boundary to the south-western corner via Elashgin soak will be closed to vehicles. This track will not be surface-ripped, as much of it has become overgrown and is regenerating naturally.

5. PUBLIC USE

The large size, diverse habitat and easy accessibility of Elashgin Nature Reserve makes it highly suitable for low-key public use. Examples of appropriate forms of use are walking, picnicking, wildflower study and photography.

Signs

Signs identifying the reserve will be erected at the north-western and south-western corners of Elashgin Nature Reserve. These signs will comply with the signs standard of the Department of Fisheries and Wildlife, which is based on wooden routed signs with pale yellow lettering on an olive green background.

PART 9 : GENERAL CONSIDERATIONS AND CONCLUSIONS

The seven nature reserves discussed provide a reasonable representation of the natural habitats in the area (Table 2). The Wyalkatchem system of nature reserves incorporates these seven reserves, plus nine others that have only recently been, or are still in the process of being gazetted. Although many are small in size, they provide a diversity of habitats, and support a variety of birdlife. In addition, these reserves provide relief in an extensively cleared landscape.

1. FUTURE MANAGEMENT

Generally until now, management of the nature reserves in this area has been conservative, with minimal interference to natural processes. This overall strategy is expected to continue, with provisions being made for the rehabilitation of areas degraded by gravel mining and rubbish dumping. Through joint vesting both the Shire and Fisheries and Wildlife will be actively involved in the planning and management of the area's nature reserves.

Protection from Fire

Discussions between the Wyalkatchem Shire Council and reserve neighbours have resulted in agreement that, if firebreaks on the boundaries of properties adjacent the nature reserves are adequately maintained, there is no need to construct or maintain firebreaks on the reserves. Fire protection of these areas is further complemented by their small size, isolation amidst cleared farmland and, in many cases, by bisecting or boundary roads.

Research

Successful management of a natural area, directed towards the enhancement of its conservation values, must be based on a detailed knowledge of the individual habitats concerned. Research provides much of this knowledge.

The Wyalkatchem nature reserves provide a range of opportunities for research. Several reserves, including Wyalkatchem and Nembudding, provide opportunities for the study of rehabilitation following gravel and sand mining. Korrelocking, with its mature Salmon Gum and Gimlet woodlands, provides an ideal site for studies of woodland in the wheatbelt. Derdibin Nature Reserve, in the southern part of the Shire, provides a good example of regeneration of salt tolerant vegetation following clearing.

Public Use

Most of the nature reserves in this Shire have been little used by the public, and in many cases it is appropriate that this trend continues. However, on easily accessible reserves such as Elashgin, Korrelocking and Wyalkatchem, people should be encouraged to use the areas for

TABLE 2: SUMMARY OF THE NATURE RESERVES IN THE SHIRE OF WYALKATCHEM COVERED BY THIS PLAN

Reserve No.	Reserve Name	Area (ha)	Vesting	Position in Landscape	Dominant Vegetation Formations	Access Classification
34527	Derdibin	133.1	WAWA	valley bottom	Samphire Dwarf Scrub D and Broom Bush Scrub	
21719	Wallambin	121.5	WAWA	valley bottom	Samphire Dwarf Scrub D and Broom Bush Scrub	
689	Korrelocking	259.0	WAWA & LA	mid to upper drainage lines	Salmon Gum and Gimlet Woodland, and York Gum Low Woodland A	LIMITED
34385	Nembudding	14.2	WAWA & LA	mid to upper drainage lines and old plateau surface	Mixed Mallee and <u>Allocasuarina acutivalvis</u> Thicket	
23877	Wyalkatchem	129.5	WAWA & LA	mid to upper drainage lines and old plateau surface	Diverse Scrub of Allocasuarina, Leptospermum, Hakea and Dryandra	LIMITED
10991	Carribin	22.7	WAWA	granite outcrops	<u>Allocasuarina campestris</u> Thicket, and Jam Open Low Woodland	
10992	Elashgin	259.0	WAWA & LA	granite outcrops	<u>A. campestris</u> and <u>Melaleuca uncinata</u> Thicket, and Jam Low Woodland	

WAWA - Western Australian Wildlife Authority, LA - Local Authority

picnicking (without fires), walking, wildflower study and birdwatching. In all cases public use should remain of secondary importance to the primary purpose of the area: nature conservation.

2. GENERAL MANAGEMENT

During the currency of this plan the Department of Fisheries and Wildlife may, with the approval of the Chairman of WAWA, undertake or authorise such other work or action as may be seen to be necessary to properly promote the stated objectives of management of the reserves covered by this plan.

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APPENDIX I : STRUCTURAL VEGETATION CATEGORIES

LIFE FORM/HEIGHT CLASS

CANOPY COVER

	DENSE 70-100%	MID-DENSE 30-70%	SPARSE 10-30%	VERY SPARSE 2-10%
Trees >30m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
Trees 15-30m	Dense Forest	Forest	Woodland	Open Woodland
Trees 5-15m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
Trees <5m	Dense Low Forest B	Low Forest B	Low Woodland B	Open Low Woodland B
Mallee Tree Form	Dense Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Mallee Shrub Form	Dense Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs >2m	Dense Thicket	Thicket	Scrub	Open Scrub
Shrubs 1.5-2.0m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub A
Shrubs 1.0-1.5m	Dense Heath B	Heath B	Low Scrub B	Open Low Scrub B
Shrubs 0.5-1.0m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub C
Shrubs <0.5m	Dense Low Heath D	Low Heath D	Dwarf Scrub D	Open Dwarf Scrub D
Mat Plants	Dense Mat Plants	Mat Plants	Open Mat Plants	Very Open Mat Plants
Hummock Grass	Dense Hummock Grass	Mid-Dense Hummock Grass	Hummock Grass	Open Hummock Grass
Bunch Grass >0.5m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
Bunch Grass <0.5m	Dense Low Grass	Low Grass	Open Low Grass	Very Open Low Grass
Herbaceous spp.	Dense Herbs	Herbs	Open Herbs	Very Open Herbs
Sedges >0.5m	Dense Tall Sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
Sedges <0.5m	Dense Low Sedges	Low Sedges	Open Low Sedges	Very Open Low Sedges
Ferns	Dense Ferns	Ferns	Open Ferns	Very Open Ferns
Mosses, Liverwort	Dense Mosses	Mosses	Open Mosses	Very Open Mosses

APPENDIX II : BIRD SPECIES SIGHTED ON NATURE RESERVES IN THE
SHIRE OF WYALKATCHEM

	34527	21719	689	34385	23877	10991	10992
NON PASSERINES							
EMUS - (DROMAIIDAE)							
Emu		x					
<u>Dromaius novaehollandiae</u>							
GREBES - (PODICIPEDIDAE)							
Australian Grebe		x					
<u>Tachybaptus novaehollandiae</u>							
HERONS - (ARDEIDAE)							
Pacific Heron							x
<u>Ardea pacifica</u>							
White-faced Heron							x
<u>Ardea novaehollandiae</u>							
DUCKS - (ANATIDAE)							
Black Swan		x	x				
<u>Cygnus atratus</u>							
Australian Shelduck		x	x	x			
<u>Tadorna tadornoides</u>							
Pacific Black Duck							x
<u>Anas superciliosa</u>							
Grey Teal		x	x	x			
<u>Anas gibberifrons</u>							
Maned Duck							x
<u>Chenonetta jubata</u>							
LARGE RAPTORS - (ACCIPITRIDAE)							
Black-shouldered Kite							x
<u>Elanus notatus</u>							
Whistling Kite							x
<u>Haliastur sphenurus</u>							
Wedge-tailed Eagle		x					x
<u>Aquila audax</u>							

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	34385					
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	10991					
	10992					
Little Eagle		x				
<u>Hieraaetus morphnoides</u>						
Spotted Harrier						x
<u>Circus assimilis</u>						
FALCONS - (FALCONIDAE)						
Australian Hobby	x					
<u>Falco longipennis</u>						
Brown Falcon	x	x	x	x	x	
<u>Falco berigora</u>						
Australian Kestrel	x	x	x			
<u>Falco cenchroides</u>						
BUTTON QUAILS - (TURNICIDAE)						
Little Button-quail						x x
<u>Turnix velox</u>						
RAILS/CRAKES - (RALLIDAE)						
Black-tailed Native-hen						x
<u>Gallinula ventralis</u>						
PLOVERS - (CHARADRIIDAE)						
Banded Lapwing						x
<u>Vanellus tricolor</u>						
AVOCETS/STILTS - (RECURVIROSTRIDAE)						
Red-necked Avocet						x
<u>Recurvirostra novaehollandiae</u>						
PIGEONS - (COLUMBIDAE)						
Common Bronzewing						x x x
<u>Phaps chalcoptera</u>						
Crested Pigeon						x x x x x x x
<u>Ocyphaps lophotes</u>						
COCKATOOS - (CACATUIDAE)						
Red-tailed Black-cockatoo						x x
<u>Calyptorhynchus magnificus</u>						

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	34385						
	23877						
	10991						
	10992						
Galah	x	x	x	x	x	x	x
<u>Cacatua roseicapilla</u>							
Long-billed Corella							
<u>Cacatua tenuirostris</u>							
PARROTS - (PLATYCERCIDAE)							
Port Lincoln Ringneck	x	x	x	x	x	x	x
<u>Barnardius zonarius</u>							
Mulga Parrot	x						
<u>Psephotus varius</u>							
Elegant Parrot							
<u>Neophema elegans</u>							
CUCKOOS - (CUCULLDAE)							
Pallid Cuckoo	x	x					
<u>Cuculus pallidus</u>							
Fan-tailed Cuckoo							
<u>Cuculus pyrrhophanus</u>							
Black-eared Cuckoo							
<u>Chrysococcyx osculans</u>							
Horsefield's Bronze-Cuckoo							
<u>Chrysococcyx basalis</u>							
KINGFISHERS - (ALCEDINIDAE)							
Red-backed Kingfisher							
<u>Halcyon pyrrhopygia</u>							
BEE-EATERS - (MEROPIDAE)							
Rainbow Bee-eater							
<u>Merops ornatus</u>							
SWALLOWS - (HIRUNDINIDAE)							
White-backed Swallow							
<u>Cheramoeca leucosternum</u>							
Welcome Swallow							
<u>Hirundo neoxena</u>							

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WRENS - (MALURIDAE)

White-winged Fairy-wren
Malurus leucopterus x

AUSTRALIAN WARBLERS - (ACANTHIZIDAE)

Weebill
Smicrornis brevirostris x x x x

Western Gerygone
Gerygone fusca x x x x x x

Inland Thornbill
Acanthiza apicalis x x x

Chestnut-rumped Thornbill
Acanthiza uropygialis x x x x x

Yellow-rumped Thornbill
Acanthiza chrysorrhoa x x x x x x x

HONEYEATERS - (MELIPHAGIDAE)

Red Wattlebird
Anthochaera carunculata x

Spiny-cheeked Honeyeater
Acanthagenys rufogularis x x

Yellow-throated Miner
Manorina flavigula x x x x

Singing Honeyeater
Lichenostomus virescens x x x x x x x

White-eared Honeyeater
Lichenostomus leucotis x

Brown-headed Honeyeater
Melithreptus brevirostris x x

Brown Honeyeater
Lichmera indistincta x x x

White-fronted Honeyeater
Phylidonyris albifrons x x x

	34527							
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	689							
	34385							
	23877							
	10991							
	10992							
Black Honeyeater								
<u>Certhionyx niger</u>								x
CHATS - (EPHTHIANURIDAE)								
Crimson Chat								
<u>Ephthianura tricolor</u>								x x x x x
White-fronted Chat								
<u>Ephthianura albifrons</u>								x x x x x x
PARDALOTES - (PARDALOTIDAE)								
Striated Pardolate								
<u>Pardalotus striatus</u>								x
WHITE EYES - (ZOSTEROPIDAE)								
Silvereye								
<u>Zosterops lateralis</u>								x x
FINCHES - (PLOCEIDAE)								
Zebra Finch								
<u>Poephila guttata</u>								x x x
MAGPIE-LARKS - (GRALLINIDAE)								
Australian Magpie-lark								
<u>Grallina cyanoleuca</u>								x x x
WOODSWALLOWS - (ARTAMIDAE)								
Black-faced Woodswallow								
<u>Artamus cinereus</u>								x x x x x x x
Dusky Woodswallow								
<u>Artamus cyanopterus</u>								x
BUTCHERBIRDS/MAGPIES/CURRAWONGS - (CRACTICIDAE)								
Grey Butcherbird								
<u>Cracticus torquatus</u>								x x x
Pied Butcherbird								
<u>Cracticus nigrogularis</u>								x x

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	21719						
	689						
	34385						
	23877						
	10991						
	10992						
Australian Magpie							
<u>Gymnorhina tibicen</u>		x	x		x	x	x
Grey Currawong							
<u>Strepera versicolor</u>		x					
CROWS/RAVENS - (CORVIDAE)							
Corvid sp.		x	x	x	x	x	x