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FAUNA STUDIES IN WATER SUPPLY RESERVE ^34537, ADJACENT TO NEERABUP NATIONAL PARK.

Prepared for: Water Authority of Western Australia

Prepared by: Dept of Conservation and Land Management

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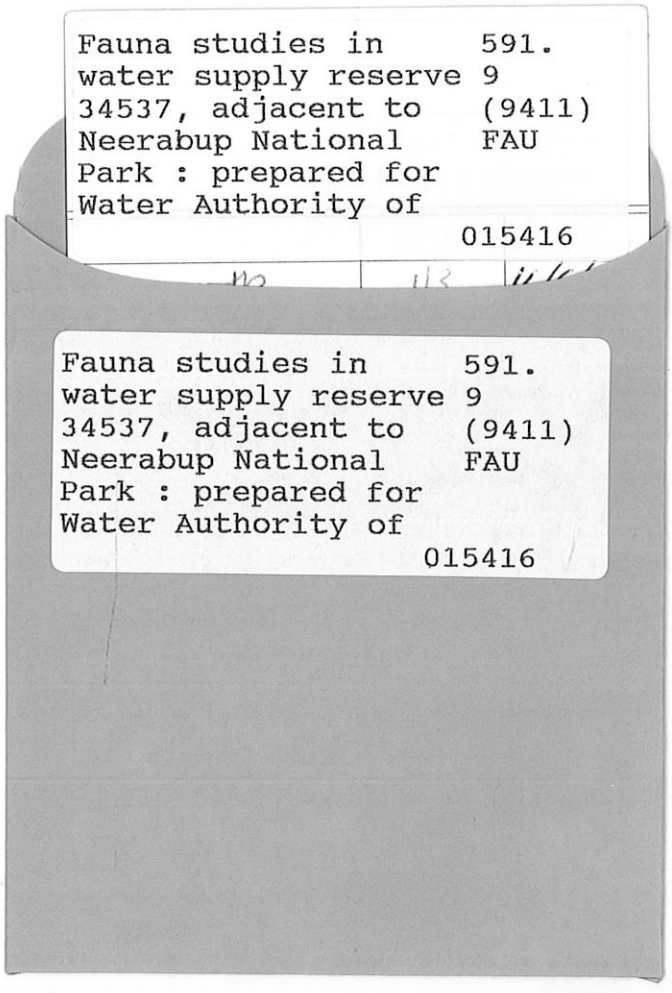
Fauna studies in water supply reserve 34537, adjacent to Neerabup National Park / prepared for Water Authority of Western Australia ; prepared by Dept. of
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

CALM staff involved in at least one aspect of field sampling in this project (in alphabetical order):

Dr Allan H. Burbidge
Dr N. Gibson
Mr G. Hartnett
Mr M. Lyons
Mr L. Mutter
Mr J.K. Rolfe

J.K. Rolfe was responsible for most of the field sampling and A.H. Burbidge was responsible for editing this report.



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1. SUMMARY

The Department of Conservation and Land Management (CALM) carried out a fauna survey of reserve A34537 in October 1993 for the Water Authority of Western Australia (WAWA) . As part of CALM's wildlife survey and management role, some additional sampling was also done in an adjacent part of Neerabup National Park.

A total of two amphibian species, 11 reptile, seven mammal (three native and three introduced) and 38 bird species were recorded in the water reserve. An additional three reptile, three bird, one native and one introduced mammal species were recorded in adjacent parts of Neerabup National Park; these species probably also occur in the water reserve.

No declared rare or threatened species were found. Two bird species recorded (White-breasted Robin and Golden Whistler) are scarce to rare on the Swan Coastal Plain, and it is recommended that consideration be given to maintaining the habitat of these two species which occur in the north-eastern part of the reserve.

The vertebrate animal communities present are very similar to those known from Yanchep National Park, although more species are known from individual sites in Yanchep due to sampling in both spring and autumn.

All species recorded are represented in conservation reserves, although the White-breasted Robin and Golden Whistler may not occur in conservation reserves on the Swan Coastal Plain. Because there are increasing pressures on the habitats represented in the water reserve, it is recommended that steps are taken to minimise the effects of earthworks and construction for the proposed water supply facility.

2. INTRODUCTION

The Water Authority of Western Australia proposes to build a water supply facility at reserve A34537 for supply of water to the rapidly expanding urban area in Perth's North-West Corridor. Since the area is currently uncleared native vegetation of previously unknown conservation value, WAWA commissioned E. M. Mattiske and Associates to undertake a flora study in 1990, and CALM to carry out a vertebrate fauna survey in October, 1993.

Specifically, the aim of the present study was to determine which species of vertebrate animal were present in the reserve, to review their conservation status and to make recommendation for management where necessary.

3. METHODS

Detailed sampling by means of pit traps, Elliott traps and systematic searches was carried out in two sites in the reserve (Fig. 1). These sites were chosen to represent the major vegetation types recognised by Mattiske and Associates (1990). The first site (D, Fig. 2a) was on the boundary of vegetation type Ds (closed scrub/heath of *Dryandra sessilis*) and vegetation type T-Js (open woodland of tuart with *Jacksonia sternbergiana*). The second site (B, Fig. 2b) was in vegetation type J-Ba-Bm-Af (low woodland/open forest of jarrah-*Banksia-Allocasuarina*). Between them, these three vegetation types cover almost the entire reserve.

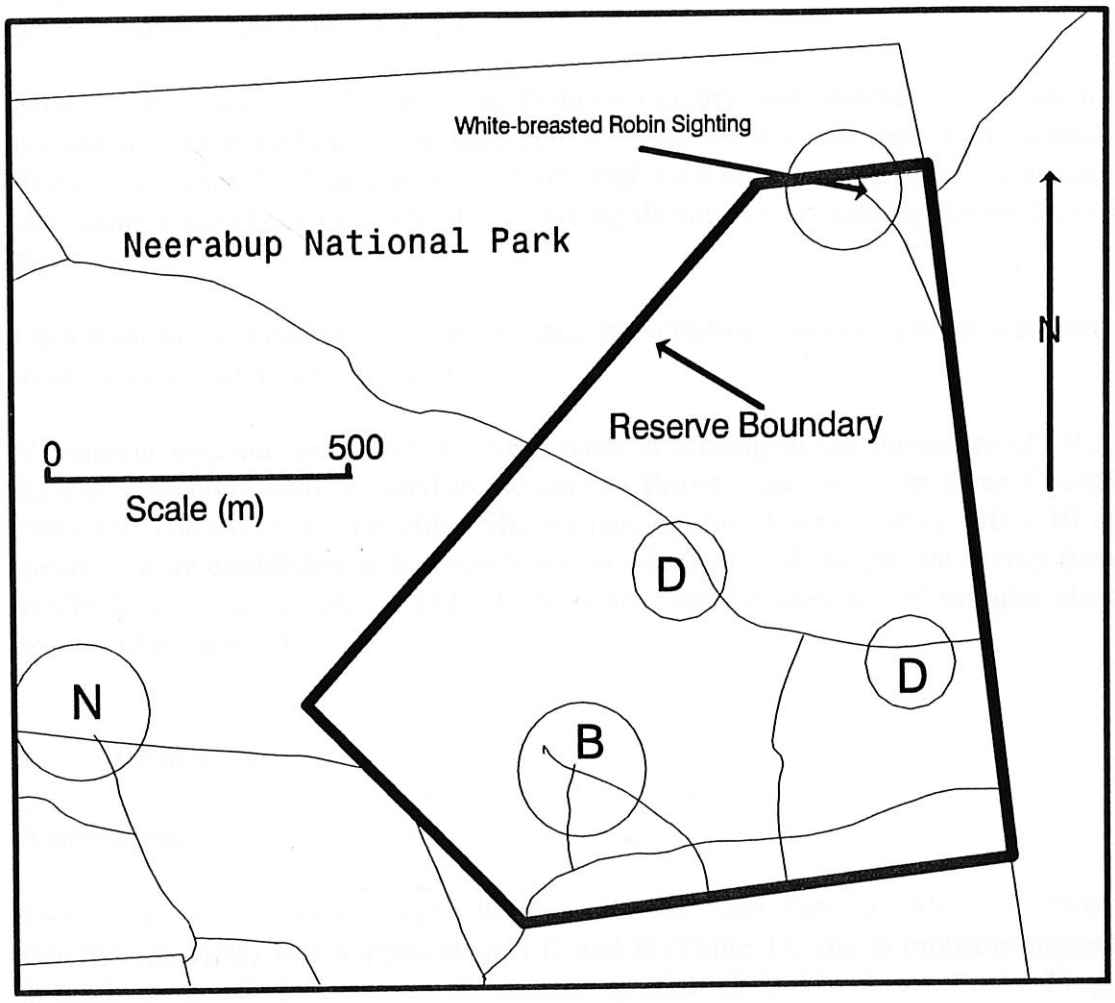

Figure 1: Location of sites (B and D) in water supply reserve ∧34537 where detailed fauna sampling was undertaken in October, 1993. Also marked is the site where detailed sampling was carried out in the adjacent part of Neerabup National Park (site N), and the site in reserve ∧34537 where the White-breasted Robin was recorded.

As part of CALM's wildlife research and management role, detailed sampling was also done concurrently at one site in an adjacent part of Neerabup National Park, to provide some comparative data. The site sampled in Neerabup National Park (N, Fig. 3a) was also in vegetation type J-Ba-Bm-Af. The data were also compared with similar data (A.H. Burbidge and J.K. Rolfe unpublished) on vertebrate animals

from similar vegetation types (tuart, *Dryandra* thickets, jarrah-*Banksia* woodlands) in Yanchep National Park.

At each site, pit traps were (60 cm deep by 12.5 cm diameter) were placed in two 50 m lines of six pits, with the pits of each line connected with a fly-wire drift fence in the standard manner (see e.g. Burbidge and Boscacci 1989). In addition, one large pit trap (40 cm deep x 28 cm bucket) with a 7 m drift fence was placed on each side of each pit line, about 10 m from the pit line. Around each bucket, three Elliott traps were placed, more-or-less equidistant and about 5 m from the bucket. Thus at each site there was a total of 12 pits, two buckets and six Elliott traps. Traps were in place for 11 nights, giving 132, 22 and 66 trap nights respectively per site for the three kinds of traps.

Mist nets were set to catch bats at site D on two nights, and searches were made for nocturnal animals by head-torch, both here and elsewhere in the reserve. Systematic daytime searches for frogs, reptiles, birds and mammals were undertaken at each site, using a variety of methods such as raking through litter, looking for tracks and signs, etc.

Opportunistic observations on the presence of vertebrate animal species were also made in other parts of the reserve.

Vegetation structure and condition were rated according to the procedure of B.J. Keighery (unpublished), as used in the current floristic survey of the Swan Coastal Plain (N. Gibson *et al.*, unpublished). As part of this floristic survey, 10 x 10 m quadrats were established at the vertebrate sampling sites of the present survey (two at site D, one each at sites B and N) and scored for the presence of vascular plant species (Appendix 1).

4. RESULTS

Amphibians

Two frog species were caught in the reserve. One species (Moaning Frog, *Heleioporus eyrei*) was trapped at sites D and B (Table 1), and is probably present through most of the reserve. A second species (Pobblebonk or Banjo Frog, *Limnodynastes dorsalis*) was only recorded at site D, where several individuals were caught.

Reptiles

A total of 11 reptiles were caught in the reserve including one legless lizard, one dragon, eight skinks and one goanna. The site richest in reptile species was N, with 12 species, followed by site B with 10 species and site D with eight species. In this instance, reptile species richness appears to be negatively correlated with vegetation density. Two legless lizards, one skink and one snake were caught nearby in Neerabup National Park, but not in the reserve. These four species are expected to occur in the reserve.

With further sampling, extra species would be detected in the reserve, including geckoes (at least two species expected), at least one extra legless lizard, more skinks, at least one more dragon, another monitor and more snakes.

Table 1: Amphibians and reptiles recorded at reserve ^34537 at Neerabup and in nearby parts of Neerabup National Park, September-October 1993. Key: D = Dryandra quadrat; B = Banksia quadrat; R = water reserve, away from quadrats; N = Banksia woodland quadrat in Neerabup National Park; NP = southern part of Neerabup National Park, away from the quadrat; numbers are individuals caught by trapping or searching; + = recorded as being present; * = species introduced to Western Australia.

	D	B	R	N	NP
Frogs					
Heleioporus eyrei	12	7			
Limnodynastes dorsalis	3				
Reptiles					
Legless lizards					
Aprasia repens				1	
Delma fraseri				1	
Lialis burtonis		2		7	
Dragons					
Pogona minor	2	1		2	
Skinks					
Cryptoblepharus plagiocephalus		1		2	
Ctenotus fallens				2	
Egernia napoleonis	1				
Hemiergis quadrilineata	3	3		8	
Lerista elegans		1		6	
Lerista praepedita		1			
Menetia greyi	4	2		3	
Morethia obscura	15	5		9	
Tiliqua rugosa	1			1	+
Monitors (goannas)					
Varanus tristis		1			
Snakes					
Pseudonaja affinis				2	

Birds

A total of 39 bird species (37 native and two introduced) were recorded in the reserve (Table 2). An additional four species were recorded in nearby parts of Neerabup National Park. These three species are likely to occur in the reserve. The site richest in bird species was site D, with 21 species, followed by site B with 19 and site N with 15.

Table 2: Birds recorded at reserve ^34537 at Neerabup and in nearby parts of Neerabup National Park, September-October 1993. Key as in Table 1.

	D	B	R	N	NP
Collared Sparrowhawk			+		
Little Eagle			+		
Laughing Turtle-Dove*			+		+
Common Bronzewing					+
Carnaby's Black-Cockatoo			+	+	+
Galah			+	+	+
Red-capped Parrot	+	+	+	+	+
Port Lincoln Ringneck	+	+	+	+	+
Elegant Parrot			+		+
Fan-tailed Cuckoo					+
Shining Bronze-Cuckoo	+		+		+
Southern Boobook	+		+		
Laughing Kookaburra*	+				+
Sacred Kingfisher		+	+		+
Rainbow Bee-eater		+	+		+
Welcome Swallow			+		
Black-faced Cuckoo-shrike		+	+	+	+
Scarlet Robin	+	+			+
White-breasted Robin			+		
Golden Whistler	+		+		+
Rufous Whistler	+		+	+	+
Grey Shrike-thrush	+		+		+
Grey Fantail	+	+	+		+
Splendid Fairy-wren	+	+	+		+
White-browed Scrubwren			+		
Weebill			+		+
Western Gerygone	+	+	+	+	+
Inland Thornbill			+		
Western Thornbill		+		+	+
Yellow-rumped Thornbill					+
Varied Sittella			+		+
Red Wattlebird	+	+	+	+	+
Little Wattlebird	+	+	+		+
Singing Honeyeater					+
Brown Honeyeater	+	+	+	+	+
New Holland Honeyeater	+		+		+
Western Spinebill		+		+	+
Striated Pardalote	+	+	+		+
Spotted Pardalote			+		
Silvereye	+	+	+	+	+
Grey Butcherbird	+	+	+	+	+
Australian Magpie	+	+	+	+	+
Australian Raven	+	+	+	+	+

Site D would be expected to have a high number of species because it was on the ecotone (boundary) between two distinct habitats, and therefore one would expect to encounter species from both habitats. Twelve species were seen during opportunistic sampling on the reserve but not at sites D or B. Most of these species would be expected to visit one or both of these sites.

Table 3: Mammals recorded at reserve ^34537 at Neerabup and in nearby parts of Neerabup National Park, September-October 1993. Key as in Table 1.

	D	B	R	N	NP
Honey Possum	2	1		3	
Grey Kangaroo	+	+	+	+	+
Brush Wallaby					+
White-striped Mastiff-Bat	+		+		
House Mouse*	1				
Rabbit*	+	+	+	+	+
Fox*			+		+
Cat*					+

Mammals

Honey Possums and Grey Kangaroos were recorded at all three sampling sites (Table 3). Apart from opportunistic sightings, the White-striped Mastiff-Bat was recorded only at site D, but insufficient sampling effort was put in at the other two sites. It would occur at these sites as this species is known to be a mobile bat foraging above the canopy, with little preference for the nature of the vegetation below.

Of the introduced mammals, rabbits were recorded at all three sites (Table 1) and cats and foxes and the house mouse undoubtedly occur throughout the area.

5. DISCUSSION

All the reptiles and amphibians are reasonably common and widespread on the Swan Coastal Plain. As noted above, further sampling would reveal the presence of further species, but it is unlikely that any rare or geographically restricted species would be found in the reserve. All species recorded in reserve ^34537 are known from Yanchep National Park except *Varanus tristis*, but this species probably occurs there also.

All the bird species recorded in the reserve except two (Golden Whistler and White-breasted Robin) are reasonably common on the Swan Coastal Plain. All except the White-breasted Robin are represented in conservation reserves on the Swan Coastal Plain, such as Neerabup National Park, as well as being in conservation reserves elsewhere.

The Golden Whistler is widespread in southern Australia and well represented in conservation reserves, but has declined on the Swan Coastal Plain to the point of being scarce in this area (Storr and Johnstone 1988).

The White-breasted Robin is known from parts of the south coast through to the Darling Range north to Canning Dam (Storr 1991), with occasional sightings further north at Bickley (Smith 1988). There is also an isolated population from Lancelin to near Geraldton. On the Swan Coastal Plain, in recent years it has only been found regularly near Harvey and Busselton, with records of vagrants at Benger Swamp and Floreat (Storr and Johnstone 1988, Storr 1991). Reserve ^34537 is therefore a previously unknown locality for this species. Here, the White-breasted Robin was found in dense *Dryandra sessilis* scrub with scattered tuarts in the north-eastern part of the reserve (Fig. 1). The species has previously not been recorded from *Dryandra sessilis* scrub, at least on the Swan Coastal Plain. Elsewhere it is usually recorded from dense thickets of *Acacia* or *Melaleuca*, or dense streamside vegetation.

The mammal species recorded in the reserve are common, widespread species. With further sampling, other species would be found to be present, with the most likely additions being several bat species. The Brush Wallaby (*Macropus irma*), which has declined significantly in recent times (Anon. 1990), was found nearby in Neerabup National Park, and is probably also present in the reserve.

6. CONCLUSIONS

Given the size and location of reserve ^34537 and the limited sampling (one season only), it is reasonably rich in vertebrate species. Sites sampled are similar in vertebrate species composition to sites in similar vegetation types in Neerabup National Park and Yanchep National Park.

Further sampling at different seasons would reveal the presence of more species, but no species vertebrate species known or expected on reserve ^34537 is rare or geographically restricted.

The record of the White-breasted Robin is of some significance, and it is recommended that disturbance be avoided in its habitat in the north-eastern section of the reserve.

The ecological communities present in reserve ^34537 are under increasing pressure from urban expansion and other threats, and so it is recommended that, during construction of any facilities on the reserve, the area of earthworks and other forms of disturbance be minimised. This will help to minimise weed invasion and enable the reserve to continue in some small way to provide protection for the ecological communities which are present.

7. REFERENCES

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APPENDIX 1.

Characteristics of sample sites.

Site D

Location: 31° 42' 39" S, 115° 45' 33" (± 100 m), in reserve ^34537.
Altitude: ca. 70 m
Vegetation: Boundary of two vegetation communities:

1) *Dryandra sessilis* scrub/thicket (2-2.5 m, >70% cover) over *Xanthorrhoea preissii* (about 2 m, 2-10% cover) over *Hibbertia hypericoides* (<0.5 m, 2-10% cover), over mixed herbs (<2% cover) and the sedge *Loxocarya flexuosa* (<2% cover). Scattered emergents of *Allocasuarina fraseriana*. Condition Very Good to Excellent.
2) Open woodland of marri (*Eucalyptus calophylla*) and tuart (*E. gomphocephala*) (10-20% cover) over shrubs of *Jacksonia sternbergiana* (>2 m, 50-70% cover) over shrubs of *Hibbertia hypericoides* and *Xanthorrhoea preissii* (0.5-1 m, 20-30% cover) over mixed herbs (30-50% cover). Condition Very Good. Last burnt 22 years ago.

Slope: gentle
Aspect: south to south-east
Surface soil: brown to orange-brown sand
Sub-surface soil: orange sand
Drainage: well drained
Leaf litter: variable, 20-90% cover
Bare ground: <1% cover
Plant species richness: a 10 x 10 m quadrat in the *Dryandra* thicket contained 36 species (14 introduced) while a similar quadrat in the woodland contained 56 species of vascular plants (15 introduced).

Site B

Location: 31° 42' 43" S, 115° 45' 21" (± 100 m), in reserve ^34537
Altitude: ca. 70 m
Vegetation: Woodland of mostly *Banksia attenuata* and jarrah (*Eucalyptus marginata*) (mostly 4-6 m, 30-50% cover) over *Xanthorrhoea preissii* and *Macrozamia riedlei* (1.5-2 m, 10-20% cover) over shrubs of mainly *Hibbertia hypericoides* (<0.5 m, 30-50% cover) over mixed herbs (2-10% cover). Condition Very Good. Last burnt 17 years ago.
Slope: gentle
Aspect: south
Surface soil: grey sand
Sub-surface soil: orange sand
Drainage: well drained
Leaf litter: variable, 25% cover
Bare ground: ca. 5% cover
Plant species richness: a 10 x 10 m quadrat contained 58 species (14 introduced)

Site N

Location: 31° 42' 40" S, 115° 45' 02" (± 100 m), in Neerabup National Park
Altitude: ca. 50 m
Vegetation: Woodland of mostly *Banksia attenuata* and jarrah (*Eucalyptus marginata*) (4-6 m, 20-30% cover) over *Xanthorrhoea preissii* and *Macrozamia riedlei* (1.5-2 m, 2-10% cover) over shrubs of mainly *Hibbertia hypericoides* (<0.5 m, 50-70% cover) over mixed herbs (30-50% cover). Condition Very Good. Last burnt 17 years ago.
Slope: gentle
Aspect: south-west
Surface soil: brown sand
Sub-surface soil: orange sand
Drainage: well drained
Leaf litter: ca. 30% cover
Bare ground: ca. 5% cover
Plant species richness: a 10 x 10 m quadrat contained 56 species (13 introduced).

Figure 2a (left): Location D in water reserve ⩚34537, at boundary of *Dryandra sessilis* closed scrub (background) and open woodland of tuart, marri and *Jacksonia* (foreground).

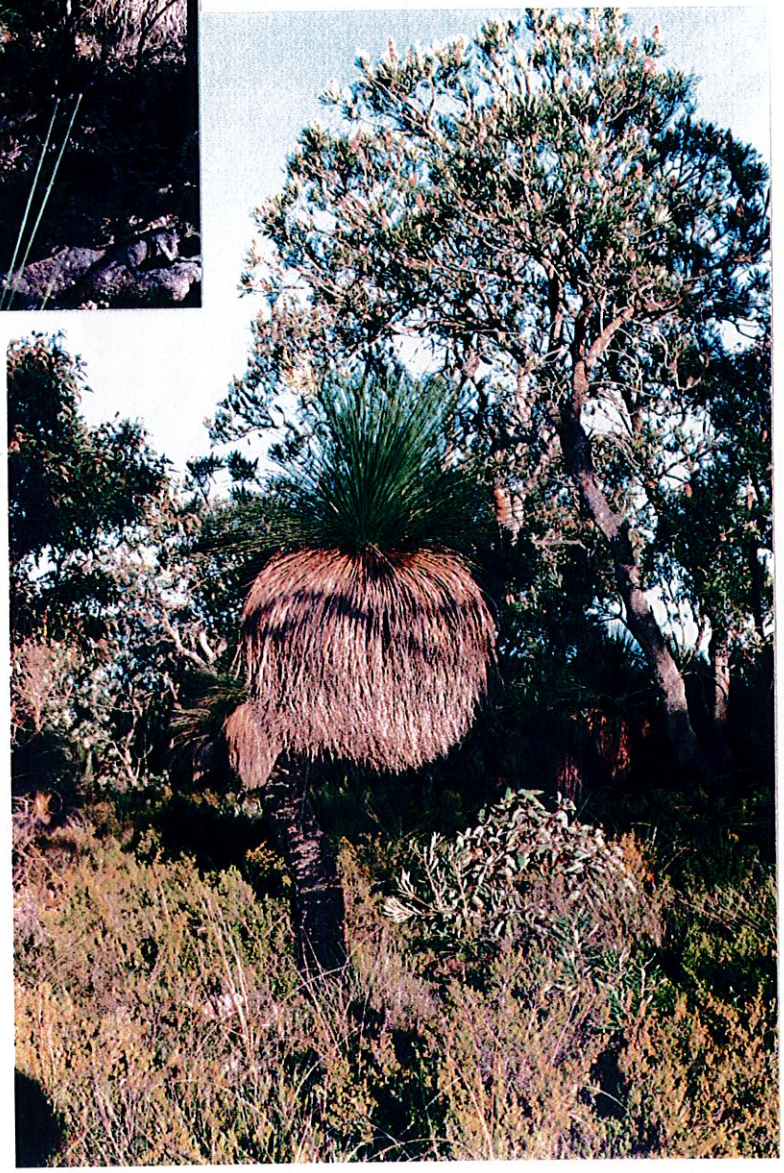

Figure 2b (right): Location B in reserve ⩚34537, in low woodland of Jarrah-*Banksia-Allocasuarina*.

Figure 3a: Location N in Neerabup National Park, in low woodland of Jarrah-*Banksia-Allocasuarina*.

Figure 3b: Closed scrub of *Dryandra sessilis* with scattered tuarts, where the White-breasted Robin was recorded in reserve ∧34537.