FAUNA SURVEY

DONNYBROOK SUNKLANDS

15th - 28th October 1975

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1. Introduction.

The geomorphological zone known as the Donnybrook Sunklands lies between the Nannup fault scarp in the east, to the Naturaliste-Leeuwin ridge on the west coast. It is bounded in the north by coastal sands and in the south by large dune systems. Surveys of the fauna in State forests within this zone were made in February and October 1974. This report describes the results of the latter survey in detail, but also incorporates additional species located in the February survey. A separate report exists for the February survey.

The purpose of the survey was to forecast the impact of a projected pine plantation scheme on fauna populations, and to locate any animal species or animal/vegetation/soil association which may be of exceptional scientific interest and therefore require particular attention in planning the pine project. A team of five completed the present study period 15th - 28th October 1974. Intermittent visits to the area and trapping was also carried out for three weeks prior to the main study period.

2. Geomorphology, Soils, and Vegetation

The geomorphology and soils have been dealt with in detail by Smith (1951). The study areas encompass two

main geomorphic types; the deeply incised valley of St. John's Brook, and the gentle to moderate undulating surface of Smith's low plateau. A generalised catenary series of the low plateau commences with dry lateritic ridges and upper slopes with pisolite gravels and a sandy matrix, through sandy lower slopes to silty, moist valley bottoms. Jarrah forest dominates the series with the exception of very moist valley bottoms where dense scrub is dominant, typical of the north-western jarrah forest swamps.

St. John's Brook carries recent moist soils of above average fertility, the undergrowth is denser than in the plateau country and blackbutt (Eucalyptus patens) contributes significantly to the tree canopy.

An aberrant soil/plant association occurs in patches throughout the sunklands but is apparently independent of any geomorphological characteristic. It is called the Kingia suite by Smith (1951), and is typified by moderate to sparse waist high scrub with stunted trees of jarrah and marri up to 6 metres high. The vegetation is reminiscent of heath types and is probably maintained by fire and edaphic conditions. Evidence exists of impeded drainage in elevated topographical situations and the soils (not examined in detail) appear to have a high clay fraction. Kingia australis is frequent.

3. West Australian Museum Records

The West Australian museum have records of 9 mammal species within the area of State Forest in the sunklands. An additional 11 mammal species are recorded within 20 km of State Forest.

4. The Study Areas.

4.1 St. John's Brook and Cambray. A steeply incised valley with fresh, moist soils and a jarrah/marri/blackbutt forest association. The area contains a large perennial watercourse with extensive pools. Burnt under prescription in spring 1973.

4.2 Great West, and Macatee Roads. Typical undulating plateau country with extensive sandy lower slopes and flats. Last burnt in 1969-1970.

4.3 Whicher Block. Plateau country dominated by laterite ridges and relatively steep sided valleys with little development of sandy lower slopes and flats.

4.4 Lawson Road. An example of the Kingia suite. Last burnt in 1969-1970/

5. Methods.

Trapping, shooting, netting, spotlighting and searching were the basic methods in all study areas except Lawson Road where observation and searching were the only methods employed.

5.1 Trapping. The bulk of the trapping effort was with breakback rat traps, and possum traps which catch alive animals up to the size of a quokka. Elliot traps were used in Whicher and Cambray for a few days but contributed little to the overall trapping effort. Small fish traps were placed in tributaries of St. John's Brook, and the main river was netted with a 2½" mesh gill net for 1 night.

Wire pen traps with a falling door mechanism were erected in the St. John's Brook and Whicher areas. These are effective for quokka and short-nosed bandicoot.

Mist nets were used at Macatee Road, Whicher and Cambray to take small species of birds which are not readily observed.

5.2 Spotlighting. Spotlighting runs were made along St. John's Brook and at Cambray and Whicher. Each run was started shortly after dusk, continued for 1½ to 2 hours and covered 10-14 km. Two spotlights were operated from one vehicle on each run.

5.3 Shooting. Approximately three hours were spent shooting bats at Cambray. Five birds were shot at various localities for laboratory specimens.

5.4 Observation and Searching. Nearly all bird records were direct observation aided by an Audubon bird-call.

Searching resulted in the location of many reptiles, some amphibians, and the spoor and scats of the larger mammals.

6. Results.

The results of the survey are presented in a way which permits the association of fauna concentrations with habitat type and locality. Where comprehensive lists are given these include species located in the February 1974 survey but which were not found in the survey on which this report is based.

The relative success of the various study methods are shown in Appendix 1 and species check lists in Appendix 2 and 3.

6.1 Species Representation. The total number of species identified from both surveys were as follows:

Mammals	-	18 (of which 6 were introduced species)
Birds	-	74
Lizards	-	19
Snakes	-	5
Tortoises	-	1
Frogs	-	9
Fish	-	6
Crustaceans		1

6.2 Animal Distribution by Plant/Soil Associations. All records of captures on the various soil/plant

associations are shown in Table 1 which gives an indication of favoured habitats.

TABLE 1

Animal Captures by Plant/Soil Associations

Association	Animal numbers							
	Mammals		Lizards		Frogs		Totals	
	Nos	Spp	Nos	Spp	Nos	Spp	Nos	Spp
Laterite ridges and upper slopes	2	2	14	7	1	1	17	10
Sandy valleys and lower slopes	10	6	31	10	18	5	59	21
Swamps	16	3	0	0	Not studied		16	3
Steep valleys, fresh soils	9	2	3	2	14	4	26	8

The most populous association in terms of both individuals and species was the sandy lower slope and valley situation. Laterite ridges and upper slopes had the low mammal populations typical of these habitats in the northern jarrah forest (Schmidt and Mason, 1973). However, they were surprisingly rich in lizards.

Swamp areas, although yielding only moderate captures, are an important habitat for the quokka (Setonix brachyurus), short-nosed bandicoot (Isoodon obesulus), and mardo (Antechinus flavipes). Captures

of these species were confined to swamps. 60 percent of southern bush-rat (Rattus fuscipes) captures were also in swamp.

The steep, fresh valley habitats had been burnt one year prior to the survey. This factor undoubtedly reduced small mammal populations which have not yet recovered to their pre-fire levels. Capture data was consequently not indicative of the potential of the area. Larger mammals were frequent and this was the only association where the brush-tailed possum (Trichosurus vulpeculus) was recorded.

6.3 Animal Distribution and Locality

Table 2 lists the numbers of species identified by capture and observation, in the various localities examined.

TABLE 2

Species Representation by Localities

Locality	Number of species			
	Mammals	Lizards	Frogs	Total
Whicher Block and Sabina Rd. (Adjacent to Whicher)	8	11	6	25
St. John's Brook and Cambray	6	4	3	13
Macatee Road and Great West Road	3	5	0	8

The data is Table 2 is unlikely to represent the entire species representation in any one area, but it gives a useful comparison of relative numbers. Whicher Block yielded the greatest variety of animals, and this location remains outstanding even if the mammal species located outside the block but in close proximity to it on Sabina Road are excluded. These species were Setonix brachyurus and Isoodon obesulus).

Species numbers were relatively low in St. John's Brook and Cambray due to prescribed burning in 1973.

6.4 Birds

The 74 species of birds identified in this survey comprised 12 aquatics, 7 species associatdd with clearings and forest glades,

3 species normally associated with heath on sandplain scrub, and 52 true forest species.

Heath sandplain species were confined to the Kingia suite of soils. The three species were crested bellbird (Oreoica gutturalis), tawny crowned honeyeater (Glicinhila melanops), and white-browed babbler (Pomatostomus superciliosus) Both the tawny crowned honeyeater and the white-browed babbler occur adjacent to or within forest in separate localities near the south coast. Their occurrence together and in the same locality as the crested bellbird is unique within the jarrah forest zone.

6.5 Snakes

Five species of snake were located. The western tiger snake (Notechis scutatus) and dugite (Demansia nuchalis) were identified in the February 1974 survey. One little whip snake (Denisonia gouldii) was collected on a laterite ridge.

One blind snake (Typhlina australis) and three Muellers snakes (Rhinhoplocephalus bicolor) were collected on the Kingia suite soils. This is the northernmost recorded occurrence of the Muellers snake, which is a species of coastal sand/heath associations.

6.6 Fish, Crustaceans, and Aquatic Reptiles

Permanently flowing water courses on the area were Margaret River (covered by the February survey) and St. John's Brook. Species collected from these two rivers are listed in Table 3.

TABLE 3

Fish, Crustaceans and Aquatic Reptiles

Species	Locality	
	St. John's Brook	Margaret River
Fish		
Bostockia porosa	X	
Brachygalaxias nigrostriatus		X
Edelia nittata	X	X
Galaxias occidentalis	X	X
Nannatherina balstoni		X
Tandanus bostocki	X	
Crustacean		
Chera preissii	X	
Reptile		
Chelodina oblonga	X	

7. Discussion

If museum records and our survey records are combined, a total of 21 mammal species have been recorded within the study area. An additional 5 species have been recorded within 20 km of the boundaries of State Forest. One of

the museum records, the flying fox (Pteropus scapulatus) is a rate vagrant. Another, the woylie (Bettongia penicillata) was not located in either of our surveys. This suggests that the species no longer exists in the area, or is of extremely limited distribution.

The range of mammal species represented in the sunklands is almost identical to that found elsewhere in the jarrah forest.

The range of bird species is likewise typical of jarrah forest associations with the exception of the southern emu wren which is, however, widespread in forest areas to the south and southeast of the sunklands, and the 3 heath-scrub species found in association on the Kingia suite of soils.

Lizards species were particularly numerous throughout the area and especially in Whicher Block. A number of the lizard records provided an extension of the previously known range of two species, (Ctenotus catenifer) and Morethia obscura)

Soil/plant associations of the Kingia suite are found at various localities throughout the sunklands. They are generally sizeable units reaching 100 to 200 ha or more in area. One such association was studied on Lawson Road by observation and searching. No trapping was done. The presence of the tawny-crowned honeyeater, crested bellbird, white-browed babbler, and the Muellers snake show this area to be of exceptional scientific interest.

8. Recommendations

8.1 The entire area proposed for pine plantations should be checked by trapping and spotlight survey to determine the status of the Woylie (*Bettongia penicillata*)

8.2 At least one block of forest should be retained in its present state to provide a permanent example of the soil/plant associations represented. This is particularly important for the sandy lower slopes and valleys which are rich in fauna and flora.

8.3 Examples of the Kingia soil suite should be retained, each with a peripheral buffer of indigenous forest.

Acknowledgements

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References

Schmidt, W. and Mason, M (1973). The effect of prescribed burning on the fauna of the Jarrah forest. Res. Pap. No.11 Forests Dept. of W.A., Perth.

Smith, R. (1951). Soils of Margaret and Lower Blackwood Rivers, W.A. Bulletin No. 262, C.S.I.R.O. Melbourne.

APPENDIX 1

Success of Various Methods of Capture

Method	Captures							
	Mammals		Lizards		Snakes		Frogs	
	No	Percent	No	Percent	No	Percent	No	percent
Pit traps	1	3	16	35			26	81
Break-back traps	7	19	21	46				
Elliot traps	6	17						
Possum traps	9	25	4	8				
Pentraps	10	28						
Hand caught			5	11	3	100	6	19
Shot	3	8						
Totals	36	100	46	100	3	100	32	100

Percent = percentage of total captures within the animal group

APPENDIX 2

Check List

Mammals, Lizards, Snakes, Tortoises, Frogs

I = non-native species C = captured

O = observed M = Museum record

Mb = Museum record within 20 km of study area

Species	Source	Notes on location etc
Mammals		
Macropus fuliginosus	O	All localities
M. irma	O	All localities
Setonix brachyurus	C	Swamp, Sabina Rd
Bettongia penicillata	M	No recent record
Trichosurus vulpecula	C	St. John's Brook
Cercartetus concinnus	M	
Tarsipes spenceraé	C	Whicher
Isoodon obesulus	O	Swamp, Sabina Rd
Dasyurus geoffroii	C	February survey
Phascogale tapoatafa	M	
Antechinus flavipes	C	February survey
Sminthopsis murina	C	Whicher
Rattus fuscipes	C	Whicher, Sabina Rd
R. rattus	I.C	February survey
Hydromys chrysogaster	Mb	
Mus musculus	I.C	All localities
Nyctophilus geoffroyi	Mb	
Chalinobus gouldii	C	Cambray
C. morio	Mb	
Eptesicus pumilis	Mb	
Pipistrellus tasmaniensis	C	Cambray

APPENDIX 2
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Species	Source	Notes on location etc
Pteropus scapulatus	Mb	Rare vagrant
Canis familiaris	Mb	
Vulpes vulpes	I. O	All localities
Oryctolagus cuniculus	I. O	Sparse all localities
Equus caballus	I. O	February survey
Felis cattus	I. C	Whicher
Lizards and Geckoes		
Cryptoblepharus plagiocephalus	C	February survey
Ctenotus catenifer	C	Whicher
C. impar	C	Whicher
C. labillardieri	C	Whicher
Egernia carinata	C	Whicher
E. Kingii	C	St. John's Brook
E. nitida	C	All localities
E. pulchra	C	Macatee Rd
E. pulchra subspecies	C	Macatee Rd
Hemergis peroni	C	Whicher, Sabina Rd
Lerista distinguenda	C	Whicher
Leiolepisma trilineatum	C	Moist gullies
Lygosama initiale	C	February survey
Morethia obscura	C	Whicher, Sabina Rd. Macatee Rd
Phyllodactylus marmoratus	C	Whicher
Menetia greyii	C	Macatee Rd
Tiliqua luctuosa	C	Whicher, Sabina Rd. Macatee Rd
Trachysaurus rugosus	C	All localities
Varanus gouldii	O	St. John's Brook
Snakes		
Demansia nuchalis	O	February survey
Notechis scutatus	O	February survey

APPENDIX 2

(cntnd)

Species	Source	Notes on location etc
Snakes		
Denisonia gouldii	C	Whicher
Typhlina australis	C	Lawson Rd
Rhinhoplocephalus bicolor	C	Lawson Rd
Tortoises		
Chelodina oblonga	C	St. John's Brook
Frogs		
Crinia georgiana	C	Whicher, St. John's Brook
C. glauerti	C	Farmland
Helioporus eyrei	C	Whicher
H. inornatus	C	St. John's Brook
Helioporus sp.	C	Whicher
Limnodynastes dorsalis	C	St. John's Brook
Litoria moorei	C	St. John's Brook
Metacrinia nichollsi	C	Whicher
Pseudophryne guentheri	C	Whicher, Sabina Rd

APPENDIX 3

Check List, Birds

Emu (Dromaius novaehollandiae)
Little grebe (Podiceps novaehollandiae)
Little black cormorant (Phalacrocorax sulcirostris)
Little pied cormorant (P. melanoleucos)
Darter (Anhinga rufa)
White egret (Egretta alba)
White-faced heron (Ardea novaehollandiae)
Brown bittern (Botaurus poiciloptilus)
Mountain duck (Tadorna tadornoides)
Black duck (Anas superciliosa)
Maned goose (Chenonetta jubata)
Musk duck (Biziura lobata)
Whistling eagle (Haliastur sphenurus)
Australian goshawk (Accipiter fasciatus)
Little eagle (Hieraetus morphnoides)
Wedge-tailed eagle (Aquila audax)
Brown hawk (Falco berigora)
Crake Spotless (Porzana tabuensis)
Bronzewing pigeon (Phaps chalcoptera)
Brush bronzewing (P. elegans)
White-tailed black cockatoo (Calyptorhynchus baudini)
Red-tailed black cockatoo (C. banksi)
Western rosella (Platycercus icterotis)
Red-capped parrot (Purpureicephalus spurius)
Twentyeight parrot (Barnardius zonarius)
Elegant parrot (Neophema elegans)
Pallid cuckoo (Cuculus pallidus)
Fan-tailed cuckoo (Cacomantis pyrrophanus)
Golden bronze cuckoo (Chrysococcyx lucidus)
Boobook owl (Ninox novaehollandiae)
Tawny frogmouth (Podargus strigoides)
Owlet nightjar (Aegotheles cristatus)

APPENDIX 3

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Kookaburra (Dacelo gigas)
Sacred Kingfisher (Halcyon sanata)
Bee-eater (Merops ornatus)
Welcome swallow (Hirundo neoxena)
Tree martin (Petrochelidon nigricans)
Pipit (Anthus novaeseelandiae)
Black-faced cuckoo shrike (Coracina novaehollandiae)
White-browed babbler (Pomatostomus supercilliosus)
Splendid wren (Malurus splendens)
Red-winged wren (M. elegans)
Southern emu wren (Stipiturus malachurus)
Western warbler (Gerygone fusca)
Broad-tailed thornbill (Acanthiza apicalis)
Western thornbill (A. inornata)
Yellow-tailed thornbill (A. chrysorrhoa)
Spotted scrub wren (Sericornis maculatus)
Weebill (Smicornis brevirostris)
Scarlet robin (Petroica multicolor)
Western yellow robin (Eopsaltria griseogularis)
White-breasted robin (E. georgiana)
Grey fantail ((Rhipidura fuliginosa)
Willy wagtail (R. leucophrys)
Golden whistler (Pachycephala pectoralis)
Grey thrush (Colluricincla rufiventris)
Crested bellbird (Oreoica cutturalis)
Black-capped sitella (Neositta pileata)
Rufous tree creeper (Climacteris rufa)
Spotted pardalote (Pardalotus punctatus)
Striated pardalote (P. substriatus)
Silvereye (Zosterops gouldii)
White-naped honeyeater (Melithreptus lunatus)
Spinebill (Acanthorhynchus supercilliosus)
Tawny-crowned honeyeater (Glicipkila melanops)

APPENDIX 3

(Cntnd)

White-eyed honeyeater (Phylidonyris novaehollandiae)
Red wattle bird (Anthochaera carunculata)
Little wattle bird (A. chrysoptera)
Red-eared firetail (Zonaeginthus oculatus)
Magpie lark (Grallina cyanoleuca)
Dusky woodswallow (Artamus cyanopterus)
Grey currawong (Strepera versicolor)
Western magpie (Gymnorhina dorsalis)
Raven (Corvus coronoides)