FIRE ECOLOGY STUDY OF THE MARINGERUP SECTION, FITZGERALD RIVER NATIONAL PARK, WESTERN AUSTRALIA.

PART 1:

PRE-BURN VEGETATION AND FLORA SURVEY

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PART 2:

A FIRE FAUNA STUDY IN FITZGERALD NATIONAL PARK FEBRUARY 1985

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REPORT PREPARED FOR THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT.

APPENDIX 5

A FIRE FAUNA STUDY
IN
FITZGERALD RIVER NATIONAL PARK.

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INTRODUCTION.

This study was commissioned by the National Parks Authority of W.A. to gain data on vertebrate fauna, its species diversity and productivity in relationship to fire management practices in Fitzgerald River National Park. This is particularly relevant to survival of rare fauna e.g. Ground Parrot (*Pezoporus Wallicus*)and Dibbler (*Parantechinus apicalis*). This study precedes an experimental aerial 'bombing' trial in 1985, and is complementary to a current study of vegetation, soil type and landforms. The study area is bounded by the western boundary (north of Gairdner River), the old No.2 Rabbit Proof Fence and an east - west line at approx 34° 08'S.

METHODS.

Prior to field work a vegetation fire-age map was prepared from aerial photography by B. MUIR. This identified four main vegetation ages Viz. 5, 15, 26 and 27+ years. These ages determined the experimental design of the project. Some fire patterns could not be age interpreted; these were ignored in the design.

a) Mammals were quantitatively assessed by pit - trapping. A drift - fence line consisting of five 0.5m lengths of 14 cm diameter PVC sunk into the ground at a spacing of *ca* 10m, joined by a continuous 20 cm high drift fence, was used. Two such arrangements were used in each vegetation age to obtain reproducibility of data and to account for habitat variability in any one vegetation age. Thus eight drift fence lines were run for five days each in Winter, Spring & Summer, generating 600 pit trap nights. Except for voucher specimens of *Pseudomys albocinereus* and *Sminthopsis griseoventer*, all mammals were identified, marked and released. Marking was done by inking tails with 'Texta colour'; this was necessary to identify recapture animals. In addition some breakback - Elliott trapping was done along creeks and on hard laterite during the winter fieldwork. This was so unproductive, recording only *Mus musculus*, that it was discontinued in later surveys.

b) Reptiles and Frogs were quantitatively assessed simultaneously with mammals by pit - trapping. To avoid recapture animals were re - located some 50 - 100m from the drift line.

c) Birds were assessed by a simple line transect method. In practice I walked in an approximately straight line for 15 minutes recording all birds seen & heard within 30m either side of the line; then I stepped off 60m perpendicular to the line and then returned parallell to the original line recording as before taking about 35 minutes in total. Using these 'small portable transects' has the advantage of allowing most habitat variability within each vegetation age to be covered. No two transects covered the same ground. Using this method I did two transects per vegetation age per day.

In addition to these prescribed techniques, much opportunistic data were recorded and headtorching, spoil & burrow digging techniques were used. Wherever possible those data were related to known age of vegetation. Time in the field occupied 35 man days including 4 days reconnaissance and pit - trap digging. Field time was allocated as follows 8 - 11 & 15 - 28 August 1984, 17 - 23 October 1984, 29 January - 10 February 1985.

Description of habitats is not attempted here, except in broadest outline, because they are subject to a separate report. Most of the study area is occupied by mallee over shrubland vegetation on loamy sand over sandy clay soils. As such the study area offers an ideal simplified experimental situation, but it does not represent the complex topographic / soil type / landform mosaic of F.R.N.P.

In the annotated lists of fauna; a record refers to a notebook entry, thus one record may be a group of animals. In opportunistic assessments of birds; I record all species when I visit a new site, irrespective of whether I've recorded them previously. On subsequent visits to the same site I only record new species. Yate refers to Flat - topped Yate (Eucalyptus occidentalis) Yate swamp refers to a 130 ha stand of Yate trees in a Winter - wet depression on the Rabbit Proof Fence. There are other smaller stands within the study area. Marningerup is a old farm on the Gaidner R., presently it is Yate parkland with regenerating Acacia cyclops thickets. The reference to '1980 FB burns' refers to the practice of burning between the buffer firebreaks on the boundaries. 1980 refers to the year of the burn; this practice has a noticeable effect of maintaining numbers of Kangaroos and bird diversity within the study area.

Habitat notations e.g. KSr/ SAc are from Muir (1977).

ANNOTATED LIST OF FAUNA.

A.BIRDS.

Dromaius novaehollandiae (Emu) Nine records, Aug & Jan, most abundant in Aug, when adults with chicks (8 & 10) were seen. All habitats.

Podiceps poliocephalus (Hoary-headed Grebe) One record, Jan, a group of 15 on Gairdner R.

Phalacrocorax melanoleucos (Little Pied Cormorant) Two records, Aug & Jan. Small groups and singly on and along Gairdner River.

Phalacrocorax sulcirostris (Little Black Cormorant) as for P. melanoleucos.

Ardea novaehollandiae (White-faced Heron) Four records, Aug & Jan. in Yate trees along Gairdner R.

Tadorna tadornoides (Mountain Duck) Three records, Aug, all pairs, at Marningerup.

Anas superciliosa (Black Duck) Two records, Aug & Jan. pairs on Gairdner R. and on Marningerup Spring = dam.

Anas gibberifrous (Grey Teal) Three records, Aug & Jan. singly and small groups to 3 on Gairdner R. and 'salt swamp' near Boggy Spring.

Anas castanea (Chestnut Teal) Two records, Aug. pairs on Calyerup CK. and 'salt swamp' near Boggy Spring.

Chenonetta jubata (Wood Duck) Three records, Aug & Jan, pairs and singly on Marningerup Spring = dam.

Lophoictinia isura (Square-tailed Kite) Five records, Aug & Oct. Generally over open mallee, (15 y.o.)

Accipiter fasciatus (Australian Goshawk) Two records, Oct & Feb. Single birds in Yate woodland.

Accipiter cirrhocephalus (Collared Sparrowhawk) Two records, Aug & Feb. single birds at Marningerup and in Yate woodland.

Aquila audax (Wedge-tailed Eagle) Four records, Aug & Feb. flying high over study area.

Hieraatus morphnoides (Little Eagle) One record, Oct. bird being harassed by Magpies at Marningerup.

Falco berigora (Brown Falcon) Nine records, Aug, Oct & Feb. in open mallee (27 y.o.) often seen in 1980 FB burn. Table 1.

Falco cenchroides (Kestrel) One record, Aug, at Marningerup.

Leipoa ocellata (Mallee Fowl) Three records, Aug & Feb. Two birds separately in 1980 FB burn situation with 15 y.o. & 27+ y.o. vegetation adjacent. A nest was constructed and eggs laid therein between Aug '84 & Feb '85 in 15 y.o. open mallee. Table 1.

? Coturnix pectoralis (Stubble Quail) One record, Feb, in open mallee (15y.o.) Table 1.

? Turnix varia (Painted Button Quail) One record, Oct, a pair in Yate woodland 15y.o.)

Charadrius melanops (Black-fronted Dotterel) Two records, Aug & Feb. calling during night at Marningerup, on granite rocks at Calyerup Creek.

Vanellus tricolor (Banded Plover) One record, Aug. calling during night at Marningerup.

Phaps chalcoptera (Common Bronzewing) Five records, Aug, Oct & Feb. in Yate woodland, along open creeks and 1980 FB burn situations.

Phaps elegans (Brush Bronzewing) Ten & records, Aug, Oct & Feb. Much commoner than P. chalcoptera, usually in denser vegetation.

Ocyphaps lophotes (Crested Pigeon) Two records, Aug & Feb. pairs at Karningerup.

Calyptorynchus latirostris (Carnaby's Cockatoo) Four records, Aug, Oct & Feb. small groups to 4 over Karningerup, Yate woodlands & open mallee (27+ Y.O.)

Glossopsitta porphyrocephala (Purple-crowned Lorikeet) Seven & records, Aug, Oct & Feb. Feeding in flowering Yate trees in Aug. otherwise always seen flying over. On 4 Feb, many small groups to 20, consistently flying E.

Purpureicephalus spurius (Red-capped Parrot) Eight + records, Aug & Feb. Most abundant parrot in study area. in all habitats, but most consistently seen in flowering Chittick (Lambertia inermis) in Feb, (age undet) Table 1.

Bernardius zonarius (Port Lincoln Parrot) Five records, Aug & Feb. usually in pairs in woodlands, Yate or Eucalyptus platypus var heterophylla.

Neophema elegens (Elegant Parrot) One record, Feb, five birds flying over.

Cuculus pyrrhophanus (Fan-tailed Cuckoo) Nine records, Aug & Oct usually heard rather than seen, in woodland situations, ocassionally in mallee. Either silent or absent in summer.

Chrysococcyx osculans (Black-eared Cuckoo) One record, Oct; in Casuarina tree along creek.

Chrysococcyx basalis (Horsfield's Bronze-Cuckoo) Nine records, Aug & Oct. usually heard rather than seen; in less wooded country than C. pyrrophanus including mallee (27 y.o. & 27+ y.o.) Table 1.

Chrysococcyx lucidus (Shining Bronze- Cuckoo) One record, Aug. in Yate / Casuarina woodland along creek.

Ninox novaeseelandiae (Boobook Owl) Three records, Aug & Oct, calling at night in woodland, once by day in mallee (15y.o.)

Podargus strigoides (Tawny Frogmouth) Two records, Aug, in Yate trees at Marningerup including female on nest.

Aegotheles cristatus (Owlet - Nightjar) Three records, Aug & Feb calling at night in woodlands.

Caprimulgus guttatus (Spotted Nightjar) One record, Aug. a pair in dense Casuarina thicket.

Dacelo gigas (Kookaburra) Two records, Aug, at Marningerup and Yate woodlands.

Merops ornatus (Rainbow Bee- eater) Five records, Oct & Feb, most frequently in woodlands, once over sandplain shrubland. On 3 Feb large numbers to 15 were amassing at Marningerup.

Cecropsis nigricans (Tree Martin) Three records, Aug & Feb flying over creeks and open mallee.

Anthus novaeseelandiae (Richard's Pipit) Two records, Aug & Oct. single birds at Marningerup and in mallee (27 y.o.).

Coracina novaehollandiae (Black-faced Cuckoo Shrike) Ten + records, Aug, Oct & Feb. much more abundant in Feb in all habitats incl 15 & 27 y.o. mallee. Table 1.

Drymodes brunneopygia (Southern Scrub Robin) Seven records, Aug & Feb. Generally in denser vegetation which has open spaces on the ground, including regenerating Acacia cyclops thickets at Marningerup. Nest with 1 egg on ground in KSi / SBc in Aug, age of vegetation undetermined, though quite old. Table 1.

Petroica goodenovii (Red - Capped Robin) One record, Aug, male in Yate woodland at Marningerup.

Melanodryas cucullata (Hooded Robin) Four records, Aug & Feb. singly and pairs; one of the few species apparently restricted to recently burnt vegetation ca 4 - 5 y.o. Often in 1980 F B burn situations. Table 1.

Eopsaltria griseogularis (Western Yellow Robin) Five records, Aug, Oct & Feb. singly usually in Yate, once in Moort (E. platypus var heterophylla) woodland.

Pachycephala pectoralis (Golden Whistler) Eight records, Aug, Oct & Feb. singly, usually in woodlands, once in mallee, 27+y.o. Table 1.

Pachycephala rufiventris (Rufous Whistler) Two records, Aug & Feb. singly in woodlands.

Colluricincla harmonica (Grey Shrike Thrush) Twelve records, Aug, Oct & Feb, singly usually in woodlands or taller mallee situations; apparently confined to older 15 + y.o. (woodlands) or 27 + y.o. (mallee) situations. Table 1.

Oreoica gutturalis (Crested Bellbird) Twenty records, Aug, Oct & Feb. singly and pairs, apparently in all vegetation ages; more abundant or calls more prolifically in winter than summer.

Rhipidura fuliginosa (Grey Fantail) Six records, Aug, Oct & Feb. singly, in open wooded country, particularly in Casuarina along creeks.

Rhipidura leucophrys (Willie Wagtail) Nine records, Aug, Oct & Feb. singly, generally in open country situations but also present in 5 y.o. and 27+ y.o. mallee. Table 1.

Psophodes nigrogularis (Western Whipbird) Twenty eight + records, Aug, Oct & Feb. more often heard that seen, apparently calls more prolifically in winter than summer. Restricted to denser mallees and shrublands $\geq$ 15 y.o. Table 1. I observed one bird prising the outside test of Hakea crassifolia nuts off, presumably in search of insects.

Pomatostomus superciliosus (White - browed Babbler) Two records, Aug. groups of 4 in regenerating Acacia cyclops thickets and in dense, low mallee (age undetermined).

Malurus pulcherrimus (Blue - breasted Wren) Four records, Aug & Feb, small groups 4-5 each with one male in nuptial plumage. In regenerating Acacia cyclops thickets and mallee vegetation with dense shrub understorey ≥ 15 y.o. Table 1.

Malurus splendens (Splendid Wren) Five records, Aug, Oct & Feb in groups to 6, including two males in nuptial plumage. In riverside or creekside vegetation with trees or mallees over dense shrubs also regenerating Acacia cyclops thickets.

Stipiturus malachurus (Southern Emu - Wren) Five records, Aug & Feb. in pairs in mallee with dense understorey > 15y.o. Table 1.

Sericornis frontalis (White - browed Scrubwren) Seven records, Aug, Oct & Feb. singly, in tall shrubs, > 1.5 m, which are themselves quite dense in vegetation ≥ 15y.o. Table 1.

Sericornis cautus (Mallee Heathwren) Six records, Oct & Feb. small groups to 3, the transect data only record birds in vegetation ≥ 15y.o., however on two occassions small groups were recorded in 1960 FB situations, where older vegetation was nearby. Table 1.

Calamanthus fuliginosus (Field Wren) Four records, Aug, Oct & Feb, singly in 5y.o. vegetation where there are low shrubs, dense in themselves, close to the ground. Table 1. Nesting in low Dryandra heath (15 Y.O.) in Aug.

Smicrornis brevirostris (Weebill) Fifty nine + records, Aug, Oct & Feb. In small groups in all habitats and all ages of vegetation. Table 1.

Acanthiza apicalis (Broad - tailed Thornbill) Fourteen records, Aug, Oct & Feb, singly in low shrubs, irrespective of upper stratum, in all ages of vegetation. Table 1.

Acanthiza chrysorrhoa (Yellow - rumped Thornbill) Two records, Aug, in Acacia cyclops thicket and Yate woodland.

Daphoenositta chrysoptera (Varied Sitella) One record, Oct, a single bird feeding under Acacia lasiocalyx bark in granite/ creek/ woodland complex.

Anthochaera carunculata (Red Wattlebird) Fourteen records, Aug, Oct & Feb. Usually in woodlands or taller mallees, occasionally in lower vegetation. Apparently in older vegetation (> 27 y.o.) Table 1. Much more abundant in winter than spring or summer.

Anthochaera chrysoptera (Little Wattlebird) Two records, Oct & Feb, only in denser, older mallees and shrublands, particularly Chittick, (Lambertia inermis).

Lichenostomus cratitius (Purple-gaped Honeyeater) Twenty eight records, Aug & Feb. Usually in woodlands or denser mallees, avoiding shrublands and open mallees, in vegetation 5+ y.o. Table 1.

Melithreptus brevirostris (Brown- headed Honeyeater) Three records, Aug & Oct, in regenerating Acacia cyclops thicket and granite/ creek/ woodland complex, also open mallee. Vegetation 15y.o. Table 1.

Melithreptus lunatus (White- naped Honeyeater) Thirteen records, Aug, Oct & Feb. only in Yate woodlands, feeding under bark.

Lichmera indistincta (Brown Honeyeater) Twenty nine records, Aug, Oct & Feb, in all habitats in vegetation 15+ 27 y.o. Table 1.

Phylidonyris novaehollandiae (New Holland Honeyeater) Sixty eight records, Aug, Oct & Feb. in small, noisy groups in all habitats, though infrequent in woodlands. Without question the most abundant bird in the study area. In all ages except 5 y.o. Table 1.

Phylidonyris nigra (White - cheeked Honeyeater) Fourteen records, Aug & Feb. singly and groups to ca 10, generally in denser vegetation than P. novaehollandiae, though also present in 5y.o. vegetation. Table 1.

Phylidonyris melanops (Tawny- crowned Honeyeater) 106+ records, Aug, Oct & Feb, singly and in pairs cf. P novaehollandiae. Uniformally present in all habitats in all ages of vegetation. Nesting in August in low bushes:- Dryandra pteriphyta (3 eggs, 15 y.o. vegetation) and grass clump in under mallee (2 chicks - 5y.o. vegetation). Feeding in flowering Hakea coryombosa & Grevillea tripartita in August.

Acanthorynchus superciliosus (Western Spinebill) Ten records, Aug, Oct & Feb. singly and pairs in woodlands, mallee & shrublands. 15 - 27 y.o. Table 1.

Lichenostomus leucotis (White- eared Honeyeater) Seven records, Aug & Feb, singly in Eucalyptus annulata near Marningerup and in 5y.o. mallee. Feeding on flowering Grevillea tripartita in August.

Lichenostomus ornatus (Yellow- plumed Honeyeater) Two records, Aug. both in Yate swamp. Feeding on flowering Yate and under bark of Paperbark tree.

Ephthianura albifrons (White- fronted Chat) One record, Feb, a small group in 1980 F B burn.

Pardalotus punctatus (Spotted Pardalote) Status & abundance uncertain. Possibly confused with P. xanthopygus.One certain record in Aug, one bird feeding on lerps in Yate suckers in woodland. P.striatus also present then. P. punctatus OR xanthopygus present in small numbers in most habitats.

Pardalotus striatus (Striated Pardalote) Eleven records, Aug, Oct & Feb. Usually in woodlands, once in mallee (27 y.o.) On 9 August some 200-300 Pardalotes were in a 'feeding frenzy' in Yate trees along the Gairdner R; they were eating lerps. In Oct & Feb, Pardalotes were much less abundant.

Zosterops lateralis (Western Silvereye) Four records, Aug, Oct & Feb. in small groups (3-4), once in Yate canopy, otherwise in dense thicket - like shrubs, Acacia & Melaleuca spp.

Emblema temporalis (Red - eared Firetail) Five records, Aug, Oct & Feb. singly in granite / woodland / creek complex. Gathering nest material in August.

Artamus personatus (Masked Woodswallow) One record, Oct, a group of 50 - 60, flying overhead and perching in 1980 FB burn.

Artamus cyanopterus (Dusky Woodswallow) Four records, Aug & oct. small groups (5 - 6) flying over mallee, perching in 1980 FB burns and in woodland. Nest building in crutch of Yate tree in August.

Artamus cinereus (Black - faced Woodswallow) One record, Feb, five birds perching in dead Yate on Calyerup CK.

Strepera versicolor (Grey Kurrawong) Fourteen records, Aug, Oct & Feb, singly, common at Marningerup, in woodlands, occasionally in open mallee or shrubland situations. Feeding young in nest in Yate tree in August, what appeared to be a Morethia - like small skink. 15 y.o. vegetation)

Cracticus torquatus (Grey Butcherbird) Twelve records, Aug, Oct & Feb, singly in all habitats in all ages of vegetation. Nest with 3 eggs in Eucalyptus tetragona in 5y.o. vegetation.

Gymnorhina tibicen (Australian Magpie) Six records, Aug, Oct & Feb. singly and small groups to 3, in more open situations e.g. Marningerup and 1980 FB burn.

Corvus coronoides (Australian Raven) Nine records, Aug, Oct & Feb. singly, usually in woodlands, occasionally in open mallee, or 1980 FB burn situations.

B. MAMMALS.

Tachyglossus aculeatus (Echidna) Characteristic scratchings were observed on one occasion in 27+ y.o. mallee. Apparently uncommon in study area.

Macropus fuliginosus (Western Grey Kangaroo) Fifty notebook entries recorded 102 Kangaroos; they were approximately evenly divided between winter, spring & summer. Usually recorded as 2 or 3, 5 was the maximum group size. Pouch young were observed twice in October. Thirty four percent of observations were in 1980 FB burn situations, 26% in 15 Y.O., 26% undetermined, 10% in 26 Y.O. 3% in 5 Y.O. vegetation. These data show the buffer firebreak burning programme is conducive to Kangaroos.

Macropus irma (Brush Wallaby) Six records, account for 8 individual animals; these data indicate they are equally likely to be found in any vegetation age.

Tarsipes rostratus (Honey Possum) Seventy nine seperate animals were pit - trapped. Table 2 indicates abundance within the fire - age regime. It shows that Tarsipes are more abundant in 15 - 27 y.o. vegetation than both younger and older vegetation. Pouch - young were present in Aug & Oct. They breed in all vegetation ages. Capture percentages were winter - 52%, spring - 26%, summer - 22%.

Sminthopsis griseoventer ( ) Sixteen separate animals were pit - trapped as indicated in Table 2. They are more abundant in 5 y.o. than older vegetation. One female had pouch - young in August in 27 y.o. mallee. Capture percentages were winter 69%, summer 31%.

Cercartetus concinna (Pygmy Possum) One was pit - trapped in 5 y.o. mallee. One other was located in Yate woodland along a creek.

Pseudomys albocinereus (Ashy - Grey Mouse) Twelve separate animals were pit - trapped. Table 2. shows they were most abundant in 5 y.o. mallee, present in 27 + y.o. mallee, but absent in intermediate ages. One female was pregnant in 5 y.o. mallee in October. Capture percentages were: winter - 42%, spring - 42%, summer - 16%.

Mus musculus (House mouse) Twenty one separate animals were pit-trapped, approximately equally abundantly in all vegetation ages, Table 2. At these numbers they are relatively very scarce in the study area compared to elsewhere in South West Western Australia. However nineteen additional Mus were trapped in breakback and Elliolt traps set along creeks in the winter survey. Capture percentages were : winter - 57%, spring - 33%, summer - 10%.

Tadarida australis (White - striped Mastiff Bat) This characteristic - sounding bat was heard at night on numerous occasions in Feb. in Yate woodlands.

Vulpes vulpes (Fox) Observed on two occasions, Oct & Feb, in 27 + y.o. mallee and in Yate woodland.

Felis catus (Feral Cat) Observed once, Oct, in dense mallee.

Oryctolagus cuniculus (Rabbit) Rabbits don't appear to have made significant inroads in the study area; they are present in relatively small numbers along Quiss Rd, and at Marningerup.

D. AMPHIBIANS.

Litoria cyclorynchus (Spotted-thighed Tree Frog) In creeks usually with granite rocks; not only associated with freshwater c.f. L adelaidensis. Locally quite abundant; on one occasion 44+ frogs were visible at once in and around freshwater pool in February.

Litoria adelaidensis (Slender Tree Frog) In situations with permanent freshwater; usually associated with Baumea articulata. Calling more prolifically in October than August or February. Also at Calyerup Rocks.

Heleioporus eyrei (Moaning Frog) In Yate woodland on fine sandy loam soil. A female in Feb, had eggs in her abdomen.

Limnodynastes dorsalis (Banjo Frog) Calling from freshwater situations in August in Yate woodland along creek. Pit-trapped in all vegetation ages, most abundant in 15 y.o.

Myobatrachus gouldi (Turtle Frog) Pit-trapped once in 27+ y.o. vegetation (KSr / SAr /SBc on loamy sand) in August.

Neobatrachus ? centralis Two pit-trapped in 5 y.o. vegetation (SAi - mallee regeneration on clayey sand) in August.

Pseudophryne guentheri One collected under granite on coarse, quartz sand along Calyerup CK. in August.

Ranidella pseudinsignifera Calling throughout study area in August from most tiny creeks and swampy depressions. See discussion. At other times restricted to freshwater. Calling from Marningerup Spring in Feb.

C. REPTILES.

Crenadactylus ocellatus (Clawless Gekko) One located under 'greenstone' rocks in KSi on clay loam.

Diplodactylus granariensis Pit-trapped in 5 y.o. & 27 y.o. mallee, also headtorched in KSc /SAc / SCi on sandy clay loam.

Diplodactylus spinigerus (Soft-spined Gekko) Pit-trapped in 15 y.o. mallee.

Phyllodactylus marmoratus (Marbled Gekko) Headtorching in Yate woodland, on granite rocks and dug from spoil heaps.

Phyllurus milii (Barking Gekko) Pit-trapped in 5 y.o. mallee, under granite & 'greenstone' rocks.

Delma australis Pit-trapped in 15 y.o. mallee and dug from spoil in 27 y.o. mallee.

Pygopus lepidopodus (Scale-foot) Pit-trapped in 27 y.o. mallee.

Aprasia repens Dug from spoil in KSr / SBi / SDc on loamy sand.

Varanus rosenbergii Pit-trapped in 27+, 27 & 15 y.o. mallee, most abundant in 27+. Present throughout study area except most recently burnt vegetation.

Ctenophorus maculatus griseus (Spotted Dragon) Ninety per cent of observations were in 15 y.o. mallee, the remainder were in 5 y.o. mallee.

Ctenophorus ornatus (Ornate Dragon) On granite rocks along creeks.

Pogona minor (Bearded Dragon) Pit-trapped in 5 y.o. mallee.

Cryptoblepharus virgatus In Yate woodlands and on granite rock.

Ctenotus impar (Eleven-lined Skink) Pit-trapped in 5,15,27+ y.o. mallee.

Ctenotus catenifer One only pit-trapped in 15 y.o. mallee.

Ctenotus gemmula One only pit-trapped in 15 y.o. mallee.

Ctenotus labillardierei Under granite rocks in granite / creek / woodland complex.

Egernia multiscutata One dug from burrow in 1980 FB burn (KSi - mallee regeneration on loamy sand).

Hemiergis peronii Under granite in granite / creek / woodlands complex, dug from spoil in 27 y.o. mallee and in Yate woodland.

Lerista distinguenda One pit-trapped in 5 y.o. vegetation in October (SAi - mallee regeneration on clayey sand.

Morethia obscura Pit-trapped in 27, 27+ y.o. mallee, also seen in most habitats with abundant leaf litter.

Tiliqua rugosa (Bobtail) In all habitats and all vegetation ages.

Notechis scutatus (Tiger Snake) One in Yate woodland, 15 y.o.

Pseudonaja affinis (Dugite) one in granite / creek / woodland complex 15 y.o.

TABLE 1. RESULTS OF BIRD TRANSECTS.

	AGE OF VEGETATION IN YEARS.			
	5	15	27	27+
Brown Falcon			x	
Mallee Fowl		x		
Quail (? Stubble)		x		
Bronzewing Pigion	x			x
Red - capped Parrot		x	x	
Horsefields Bronze Cuckoo			x	
Black-faced Cuckoo Shrike		x	x	
Bellbird	x	x	x	
Golden Whistler				x
Western Shrike Thrush				x
Southern Scrub Robin		x		
Hooded Robin	x			
Willie Wagtail	x			x
Western Whipbird		x	x	x
Blue-breasted Wren		x		x
Emu Wren		x	x	x
Field Wren	x			
Broad- tailed Thornbill	x	x	x	x
Mallee heath Wren		x	x	
Weebill	x	x	x	x
Spotted Scrub Wren		x	x	x
Brown Honeyeater		x	x	
Brown-headed Honeyeater		x		
New Holland Honeyeater		x	x	x
Purple-gaped Honeyeater	x	x	x	
Red Wattle Bird			x	
Tawny-crowned Honeyeater	x	x	x	x
White-eared Honeyeater	x			
White-cheeked Honeyeater	x	x	x	
Western Spinebill		x	x	
Striated Pardalote			x	
Magpie	x			
Grey Butcherbird		x		x
Aust Raven			x	

DISCUSSION.

Data in fig. 1 and table 1 show that bird diversity in FRNP mallees reaches a maximum at around 15 years post - fire. This result applies largely to small passerine species. It is evident that even in 5 years post - fire vegetation bird utilization is not confined to larger, stronger - flying open country birds, since Field Wren, Broad-tailed Thornbill and Mallee Heath Wren - (see annotated list) are all present here. Apparently mallee regeneration provides sufficient dense, ground level shrubs as mallee 'suckers' for these small passerines which belong to the 'resident - insectivore' category of Kitchener et al (1982). Species apparently restricted to 15+ Y.O. vegetation are also 'resident - insectivores' they include the larger Grey Shrike Thrush, Southern Scrub Robin, Western Whipbird and smaller Blue breasted Wren, Southern Emu Wren, Spotted Scrub Wren. These are probably dependent upon more abundant or different insects and denser vegetation. Only three species Weebill, Tawny-crowned Honeyeater and Broad-tailed Thornbill were common to all fire age vegetation.

The situation with mammals is very different; number of species is greatest in 5 Y.O. vegetation, declining at 15 Y.O. and rising again in older vegetation, fig.1. I am unable to decide whether this trend is a real effect or a consequence of high sampling error. Further research could be directed at this question. Of the mammal species most abundant in 5 Y.O. vegetation one, Pseudomys albocinereus is a granivore, the other Sminthopsis griseoventer is a carnivore / insectivore. Tarsipes rostratus, a nectivore is most abundant in 15 Y.O. vegetation; a similar situation to nectivorous honeyeaters. That insectivorous birds, mammals and reptiles, granivorous and carnivorous mammals can exist in quite high numbers in 5 Y.O. vegetation indicates that in this time a degree of ecological complexity and probable establishment of food chains has been achieved. The only feeding group disadvantaged in 5 Y.O. vegetation is one apparently obligate nectivorous mammal, Tarsipes rostratus and several honeyeater species. Reptiles show a similar trend to mammals in the diversity - fire age regime.

It is important to know whether the vertebrate species (except birds) present in 5 Y.O. vegetation are fire survivors or post-fire re - colonisers. This study is inconclusive in that respect as the 1979 burn was relatively small and no point within it was more than 0.5 Km from 27+ Y.O. vegetation, and this distance is certainly within the capacity of some small vertebrates to re-colonise. For example Tarsipes will move atleast 800m, R. Wooller(pers. comm.) in Worsley Alumina (1985). Rodents and most reptiles probably survive the immediate effect of fire, in burrows but might suffer a food shortage thereafter. However recent observations in FRNP indicate that ants, spiders and scorpions are present one day after even a very hot fire.

Four species Tarsipes rostratus, Pseudomys albocinereus, Tawny - crowned honeyeater and Grey Butcherbird were breeding (see annotated list) in 5 Y.O. mallee regeneration. That these will breed in vegetation so recently burnt that it would not presently carry a fire (this assessment should be confirmed by someone with more experience than I as it is rather important) indicates that a degree of burning confers 'survival insurance' on some species. The 1979 fire studied here was probably quite hot as it was an escaped clearing burn in either February or March 1979, G. Duxbury (pers. comm.) Although data in this study generally support the concept of maintenance of environmental heterogeneity through burning, another local study in the Ravensthorpe Range reported abundant and diverse mammal and bird faunas, including most species in common with this study, in mallee vegetation unburnt for well in excess of 30 years, Chapman (1984)

The fauna recorded in this study are representative of most of the more common fauna of FRNP as a whole. Ninety of 125 bird species (excluding seabirds and waders), eight of 13 mammal species, 24 of 37 reptiles and 8 of 10 frogs occurring in FRNP occur in the study area. Frogs in particular are well represented; extensive rains in early August 1984 were conducive to frogs at the times of this survey.

In view of the Heritage Committee funded fauna and flora studies shortly to commence and the recent fires in FRNP I propose that the survey design be addressed to answer some of the questions raised by this study. In particular:-

1. That mammal and reptile surviorship and recolonisation be assessed by surveying the recently burnt area centrally and peripherally.

2. That very old vegetation (30+Y.O.) be surveyed for vertebrate species diversity and abundance.

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Post Script.

On 28 February 1985, Ranger Martin Lloyd collected a Mitchells Hopping Mouse (Notomys mitchelli) near Calyerup Rocks some 2.5 Km west of FRNP. The previous closest record is Lake Magenta. If, as I suspect, this species is restricted to granite - derived sandplains of the Pre - cambrian shield, its occurrence within FRNP is unlikely unless it occurs in the north of the present study area in the vicinity of Calyerup Creek.

FIGURE 1. QUANTITATIVE FAUNA ASSESSMENTS

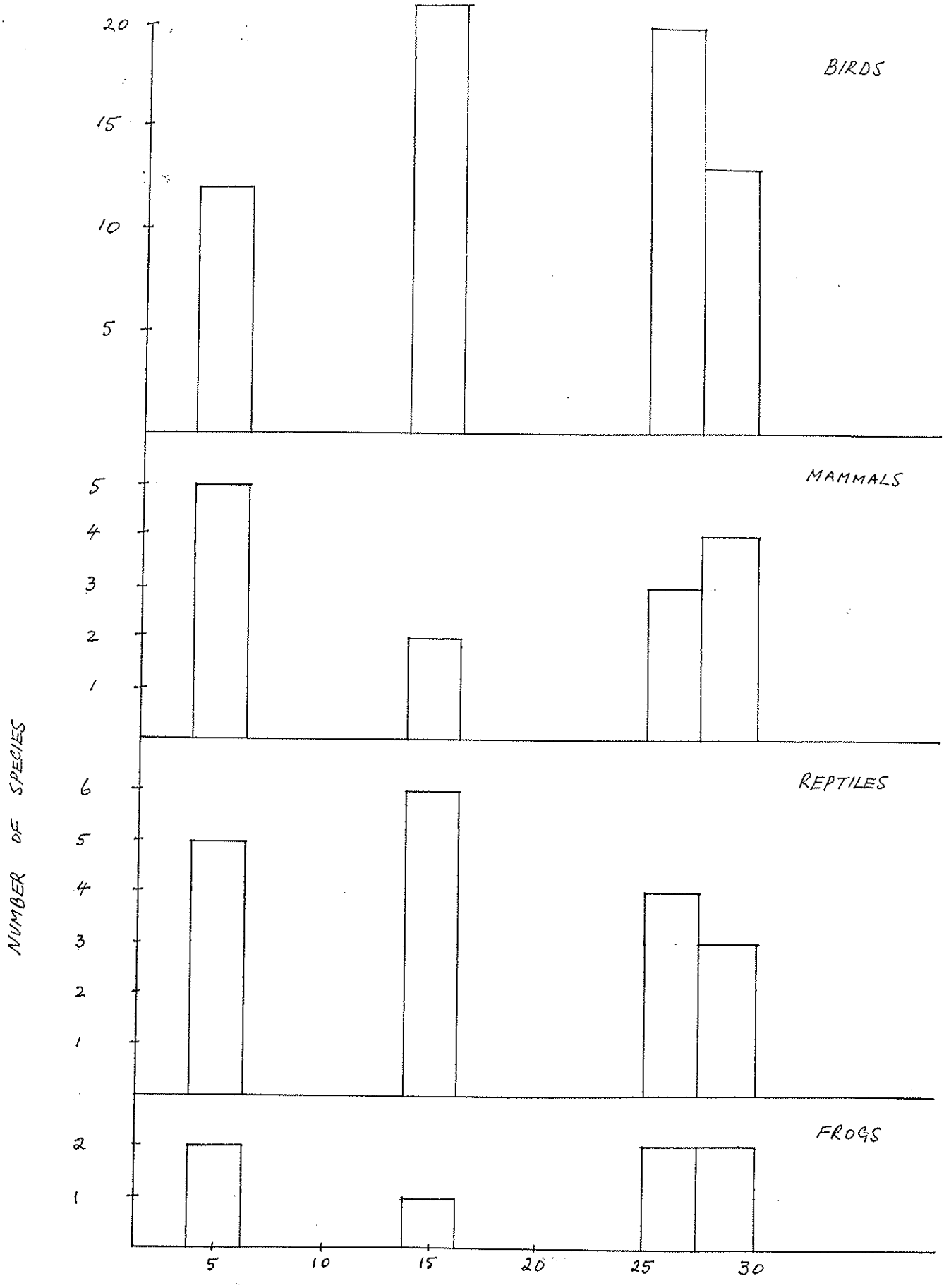

FIG. 2. RESULTS OF PIT-TRAPPING
(No. INDIVIDUALS EXCLUDING RECAPTURES)

	YEARS SINCE LAST FIRE			
	5	15	26	27+
Tarsipes rostratus	11	29	22	17
Pseudomys albocinereus	10	0	0	2
Sminthopsis griseoventer	9	0	5	2
Cercartetus concinnus	1	0	0	0
Mus musculus	4	5	6	6
Diplodactylus granariensis	2	0	0	0
D. spinigerus	0	1	0	0
Phyllurus milii	1	0	0	0
Delma australis	0	1	0	0
Pygopus lepidopodus	0	0	1	0
Pogona minor	1	0	0	0
Varanus rosenbergi	0	1	1	3
Ctenotus catenifer	0	1	0	0
C. gemmula	0	1	0	0
C. impar	2	2	0	5
Morethia obscura	0	0	1	1
Lerista distinguenda	1	0	0	0
Limnodynastes dorsalis	1	5	1	4
Myobatrachus gouldi	0	0	0	1
Neobatrachus ? centralis	2	0	2	0