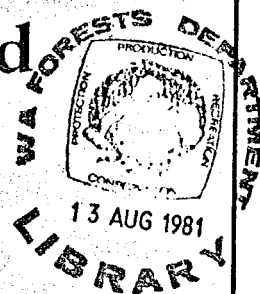
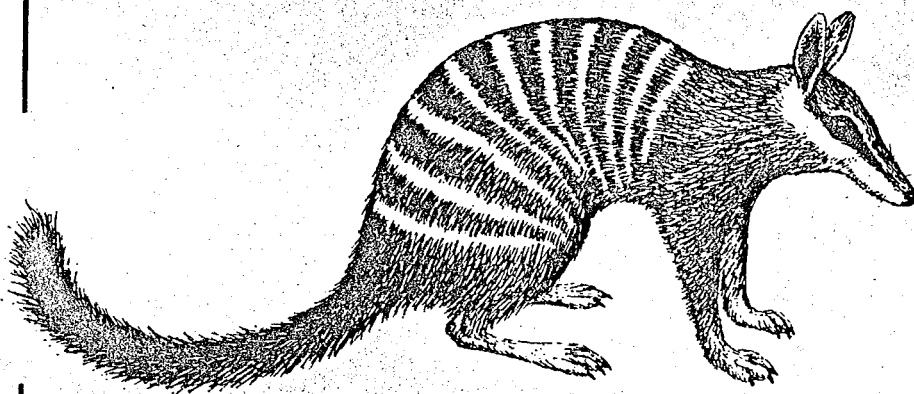


Rare, Restricted & Endangered Fauna of the Jarrah and Karri Forests



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1.

INTRODUCTION

The Jarrah, Karri and remnant Tuart forests constitute the entire tall timber forests of most of Australia, west of the Great Dividing Range. The areas of these which are held in State Forests are 1,451,000 ha, 140,000 ha and 3,000 ha respectively. In total they represent less than 1% of the area of the State of Western Australia. Between them and the tall forests of the east and south-east of Australia are woodlands, mallee, and low shrublands of relatively low rainfall zones. These have been extensively cleared for agriculture, heavily grazed and in many places, invaded by feral animals such as rabbits, foxes, cats, donkeys, and camels.

The Jarrah, Karri and Tuart forests therefore provide the last great refuge and genetic reservoir for many species of plants and animals which formerly occurred over a wide area. In addition these forests contain wildlife species which are rare, endangered or restricted in their distribution.

At present large areas of the Jarrah are threatened by strip-mining for bauxite, or pine reforestation schemes; the Karri is suffering extensive clear-felling; and both forests are subjected to regular fire or controlled burning. These factors both separately and in combination can be expected to reduce the value of the forests as a wildlife refuge and to actually endanger the existence of some species.

The purpose of this paper is to document what is known concerning declining, restricted, endangered and rare species of fauna which occur in these forests. Similar data on plants is available in Marchant and Keighery (1979). This information reinforces the argument that native forests are far more than a collection of trees and that multiple use management of these forests must include the setting aside of very large areas in permanent reserves free from forestry and mining operations for the conservation and protection of wildlife.

2. CODING

The description of species of wildlife as rare, endangered, restricted etc. is fraught with difficulties. Large areas in which species may occur have not been thoroughly surveyed by competent persons and the classification and range of species of many groups are poorly understood. Future surveys and taxonomic revisions may therefore alter the status of species either favourably or unfavourably.

Nevertheless it is valuable to document the current state of knowledge as management must be based on these objective data rather than future possibilities. We are fortunate in this respect to have several recent articles on this topic by various authorities. These have been used extensively to compile the lists below.

Unfortunately, very little data is readily available on the invertebrate fauna and apart from Crustacea, these have not been included. The important role of these organisms in forest ecology and in the food webs of vertebrate fauna must, however, be emphasised.

3. RARE, ENDANGERED AND RESTRICTED FAUNA

3.1 INVERTEBRATE FAUNA

3.1.1 Crustacea

Riek (1967) lists two species of crustacea which are apparently restricted to rivers within the Karri forest. These are Cherax crassimanus and Engaewa subcoerulea.

Engaewa subcoerulea has been recorded in the literature only from Inlet River, a small creek in the Shannon River Basin area which runs into Broke Inlet. It digs burrows up to a metre in depth in swampy ground.

Cherax crassimanus is known only from the Beedelup Falls and Warren National Parks where it lives in small pools in flowing streams.

The crustacea of south-west Australia are in need of systematic survey. It is probable that both of the above species have wide distribution within the Karri as their typical habitat is common

3.2 VERTEBRATE FAUNA

3.2.1 Fish

One species of fish, Lepidoglauxis salamandroides, is apparently restricted to the Karri forest. This species is peculiar and its affinities are unclear. Formerly it was known from only one small tributary of the Shannon River but a note in the Annual Report of the Western Australian Forests Department (1978) describes it as "... one of the very few vertebrate species whose range is almost entirely confined to the woodchip licence area. A survey indicates that its occurrence is associated with the southern acid, peaty heath "flats" and that it rarely occurs in Karri forest streams" (p.23). This report concludes, perhaps too blithely, that "Logging operations are therefore unlikely to affect it in any way" (p.23).

3.2.2. Frogs

Some 19 species of frogs live in the Jarrah, Karri and Tuart forests (Barker & Grigg, 1977). Most of these have a general distribution in south-western Australia but six species have restricted ranges. Three burrowing frogs of the genus Heleioporus are restricted to the Darling Range and therefore to Jarrah forest ecosystems. H. barycragus burrows "... in the banks of temporary watercourses on the slopes of the Darling Range" (Barker & Grigg, p.130); H. inornatus is "... usually found in sandy acid peat bogs where the principal vegetation is Xanthorrea " (p.132); and H. psammophilus is "... confined to sandy areas of the Darling Range and its foothills" (p.134). The geographic range of the small frog Ranidella pseudinsignifera is also given as the Darling Range.

Nicholl's Toadlet (Psuedophyrne nichollsi) is restricted to the Karri forest where it is usually found in or under rotten logs or among the thick leaf litter on the floor of the forest. As these two components of the forest eco-system

may be eliminated by control burning and regeneration techniques, the security of this species warrants investigation. In addition, two other species apparently have very limited ranges within the Karri. Geocrinea lutea is known only from the Nornalup area, and G. rosea from the Warren River. If G. rosea is truly confined to the Warren River it would be important to determine the effects of increasing salinity on its survival.

3.2.3 Reptiles

Jenkins (1979) in his review of the status of endangered Australian reptiles does not mention any species which are primarily located within the South-west forests. Nevertheless he cautions that previously unknown species are continuously being recorded, that taxonomic revisions are recognising new species increasingly and that lack of knowledge on the biology of many Australian reptiles hinders assessment of their status in the wild.

Several species are known to have important populations within the Jarrah and Karri forests. The Carpet Snake Morelia spilotes, which is listed as rare and likely to become extinct under Section 14 of the Wildlife Conservation Act, is fairly common to both forests. Cogger (1975) states that Ctenotus delli is apparently confined to the northern Darling Range and Storr (1973) defines its range more precisely as being from the Helena River to Mt. Cooke. Storr (1967) describes the distribution of Sphenomorphus australis as from Collie south to Cheynes Beach but notes that Collie specimens have some peculiarities. The same author (1975) also describes the Darling Range population of Hemiergis initialis initialis as a geographical variant and the far south-western population of Hemiergis peronii peronii as a tetradactyl (i.e. three-toed) form. Finally Storr (1976) indicates that the main distribution of Lesista microtis microtis may be within the Jarrah forest.

3.2.4 Birds

The Red-eared Firetail (Emblema oculata) is a small finch which is largely restricted to the Jarrah and Karri and which is listed as rare and likely to become extinct under Section 14 of the Wildlife Conservation Act of Western Australia. Within the Jarrah forest, this species is typically found in thickly vegetated gullies and river courses. Both of these habitats may be severely modified by bauxite mining and damming of water catchments. In the Karri the species is more ubiquitous but the clear-felling programmes which will eventually cover most of this forest may severely modify the understorey on which the species depends. It is probable that the Red-eared Firetail is a declining species as a result of these combined onslaughts on its habitat.

Recently the W.A. Forests Department (Annual Report 1978) has claimed that during fauna surveys of *Pinus radiata* plantations in the Blackwood Valley the Red-eared Firetail " ... was found to be common in most plantation areas" (p.23). They attribute this tentatively to the presence of seeds from introduced grasses and weeds which provide a food source. However remnant stands of native vegetation may also be of fundamental importance to these populations. This has been found to be the case for other species elsewhere in Australia (Davidson, 1976). The size and the ecology of these populations of the Red-eared Firetail deserve more extensive objective study.

The White-breasted Robin (Eopsaltria georgiana) is only common in the Karri forest which must be its stronghold. The main populations of the Western Thornbill (Acanthiza inornata) and the Red-winged Wren (Malurus elegans) are also within the Jarrah and Karri forest. All of these species prefer understorey habitats. Such habitats are damaged by forestry silvicultural techniques and bauxite mining. Their future security must therefore remain in doubt.

Finally the Red-capped Parrot (Purpureicephalus spurius) displays a marked preference for the seeds of the Marri (E. calophylla), the most extensive stands of which adjoin the Karri forest. These stands are the prime target for clear-felling programmes. Smith (1979) lists the species as restricted, uncommon and declining.

3.2.5 Mammals

Christensen & Kimber (1977) provide a list of the mammals of Western Australian forests which includes an assessment of status and needs. The Jarrah and Karri forests constitute important conservation areas for at least six of the thirty species listed. These are:

- (i) Western Brush Wallaby (Macropus irma) - a major population of this species occurs in the Jarrah forest where it is common.
- (ii) Tammar (Macropus eugenii) - a declining species but with several populations within reserves in southern Australia (Poole, 1979), it has a sparse distribution in the Jarrah forest where it is confined to dense vegetation.
- (iii) Quokka (Setonix brachyurus) - the mainland population of this species is within the Jarrah and Karri forests where it is confined to dense swamps.
- (iv) Woylie (Bettongia penicillata) - this species has declined markedly since European settlement and it is now restricted to the eucalypt woodlands of the south-west and particularly the Tone-Perup forest blocks (Poole, 1979). It has a patchy distribution elsewhere in the Jarrah forest.
- (v) Chuditch (Dasyurus geoffroii) - Archer (1979) notes that the Chuditch or Western Native Cat has apparently disappeared from Queensland, New South Wales, Victoria and South Australia and is now restricted to south-western Australia where it is only common in State Forests. He considers it to be endangered.

- (vi) Numbat (Myrmecobius fasciatus) - this species has also seriously declined since European settlement and is now confined to south-western forests particularly the Wandoo. It also occurs within the Jarrah forest. Archer (1979) considers the Numbat to be endangered and notes, "Numbats evidently utilise hollow fallen logs to make homes (Calaby 1960). This may make their survival in any area a function of ground fire intensity. Further, much of their preferred habitat in Wandoo forest is underlain by superficial bauxite deposits and this has in the past, and may in the future, pose a threat in the form of strip mining.

"Although the Numbat is fully protected by law, such nominal protection is always subject to being over-ridden by decisions made in mining wardens' courts" (p.31).

In addition to these species, Winter (1979) draws attention to the distinctive form of the Common Ringtail Possum (Pseudocheirus peregrinus occidentalis). He states that this sub-species is distinct morphologically and in its behaviour and is also geographically isolated and therefore merits consideration in its own right. He continues, "Although its geographical range ... is greater than most of the north-eastern rain forest possums, it is probably under greater threat. Its preferred habitat is peppermint (Agonis flexuosa) woodland, though it also occurs in Jarrah and other forests (M. Ellis pers. comm.). These habitats are coming under increasing pressure from agriculture (e.g. Valentine & Enright 1975), bauxite mining and the woodchip industry (Adair et al, 1977; Conacher, 1975, 1977) all of which involve clear-felling the forest. The decline of the Ringtail in Western Australia was first noted in the early 1900's when Glauert considered the population on the Margaret River, described by Shortridge (1909) as plentiful, was reduced to small isolated colonies (Troughton, 1967). In the early 1970's M. Ellis (pers. comm.), noted a sharp population decline based on observations of populations and on regular road kill transects.

"The current status ... is uncommon except for local concentrations ... Although not considered endangered, its position may rapidly become precarious if large-scale clearing of its habitat takes place, a situation that needs careful monitoring" (pp.54-55).

4.

CONCLUSION

It is apparent from the information presented above that the Jarrah and Karri forests of south-western Australia are a major reservoir of rare, restricted and endangered fauna. It is also obvious that the ability of these forests to fulfil a conservation role will necessarily diminish with the area of forest that is subjected to extractive industries and particularly to bauxite mining, pine afforestation and clear-felling, which cause severe modification of the existing habitat. If these activities are not restricted then the value of our forests for fauna conservation will depend on the number and size of secure reserves set aside for this purpose.

Unfortunately, the existing system of reserves offers little hope of effective long-term wildlife conservation. The Commonwealth Department of Environment has suggested that for even relatively abundant species of mammals, reserves should not be less than 6,000 ha. in area with much greater areas for less abundant species. In order to be self-perpetuating, a forest eco-system reserve would need to be at least 20,000 ha. in extent. In contrast to these estimates, the largest National Park in the Jarrah has an area of 1,790 ha. The Walpole-Nornalup National Park in the Karri forest covers 18,063 ha. However, only 18% of this or 3169 ha. is Karri and Karri-Marri, the remainder consists of other vegetation types.

These reserves are supplemented by a series of Management Priority Areas and Forest Parks managed and controlled by the Western Australian Forests Department. Although many of these are large in area, they do not have any legal

security and their reserve status is purely at the discretion of the Conservator of Forests. Current departmental policy regards the Management Priority Areas simply as buffer zones which surround Forest Parks and which are liable to logging and other forest management techniques. They may even be clearfelled as is to be the fate of Beavis and Giblett M.P.A's within the Karri forest. Moreover, within the Karri, the area set aside as Management Priority Areas in 1977 (some 35,000ha.), represented only 60% of the area that was recommended to be set aside in 1976 (58,000ha.), by the Environmental Protection Authority.

While the wildlife of our forests continues to suffer from this variety of large-scale extractive industries and while there continues to be no effective, secure, reserve system, the future value of the Jarrah and Karri forests for wildlife conservation must remain in doubt. There is an urgent need for a series of large secure reserves and for the exclusion of some extractive techniques or industries throughout these forests to guarantee their long-term survival.

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