# A STUDY OF SMALL MAMMALS IN THE NORTHERN JARRAH FOREST

by

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Most would agree that the wildlife resource of Western Australia, as an integral part of the forest community, requires "proper management". There would probably be less agreement, however, as to what form this management should take. In brief, we have only a limited idea as to the consequences of many of our past and present forest practices on the fauna of this State. One such practice that falls into this category is controlled burning.

The use of fire as a management tool for manipulating wildlife habitats is not a new concept. For over 300 years, fire has been used in the moors of Scotland to recycle and maintain the heathland vegetation necessary for a balanced environment for red grouse (2). Similarly, controlled burning is used in parts of North America to provide suitable food and cover for quail, deer, elk and other species.

In Australia, controlled burning is commonly used to reduce the risk of uncontrollable wildfires. However, as Hodgson (2) states, ... "There are few examples where it (fire) is used as a tool to produce or conserve a particular example. But this is not because fire is not involved in the ecology of other forest values. It is because many of these values do not have a direct dollar value and there is no interest from people prepared to spend money in establishing the ecological relationships. For instance, fire is quite definitely a major factor in the occurrence, distribution and conservation of acacias and heaths and the animal populations associated with them. But rarely do we ever see fire being deliberately used to conserve these values."

It seems obvious that field investigations into the effects of controlled burning on the forest fauna are needed. In mid-April, following the Fauna School conducted by Mr. Harry Butler, a fauna survey was undertaken in the Dwellingup Division to investigate the implications of the Department's controlled burning practices on fauna in the northern jarrah forest. A 2-staged approach was devised with the following basic objectives.

Stage 1

(1) A field evaluation of the effectiveness of various trapping techniques.

(2) An extensive trapping programme to determine what mammal species occur locally and the type(s) of vegetation they inhabit.

Stage 2

(1) A periodic, detailed survey of several study areas to assess both the effects of controlled burning and fire exclusion on population numbers, distribution, etc., of mammls selected for study.

In Stage 1, the procedure has been to trap various vegetation types using several different trapping techniques. Animals that were live-trapped were anaesthetised, measured and weighed, marked by toe clipping for future identification and released. Interim results indicate that of the 9 species of mammals trapped, three occur in relatively large numbers locally and are readily caught using box traps, while another species can be trapped with wire snares. These mammals are respectively the introduced ship rat, the yellow-footed marsupial mouse or mardo, the short-nosed bandicoot and the short-tailed pademelon or quokka (refer to Tables 1 and 2). Rat (killer) traps have also proven successful, but their use is not envisaged in Stage 2 investigations.

Other mammals such as the chuditch or native cat (Dasyurinus geoffroii), the brush-tailed possum (Trichosurus vulpecula), and the common wambenger (Phascogale tapoatafa), all which have been reported in the Dwellingup area, have not been encountered in the trapping programme as yet.

Referring to Table 2, it appears that swamps, in contrast to upland sites, provide the most suitable habitat for many of the small mammals in the northern jarrah forest. If further investigations support this conclusion, then some system of deferred rotational burning for swamps may prove desirable from the standpoint of insuring adequate food and cover for a given area.

Of the 169 catches recorded, 59 were recaptures (animals previously caught, marked and released). A few animals, particularly mardos, became "trap prone" and were

retrapped 6 - 7 times. These recaptures show that the mardo, in comparison to the ship rat, ranges over a larger area in search for food. Individual mardos were found to move as far as 10 chains in a 24 hour period while the furtherest movement recorded for a rat was 7 chains.

As part of the second phase of the fauna survey, 6 study areas (3 control areas and 3 areas to be aerial burned during the spring in 1971) will be systematically trapped at regular intervals over a period of several years. Information from this study should provide answers to some of the questions raised earlier. For, as Dunbavin Butcher (1) stated, we not only must learn how animal populations react when fire is used as a forest management tool, but we must also learn more about the ways in which fire can be used primarily for the management of wildlife.

(1) Butcher, A. Dunbavin. 1970. Fire and the Management of Wildlife. Second Fire Ecology Symposium, Monash University, November 28, 1970.

(2) Hodgson, A. 1970. Fire as a Forest Management Tool. Second Fire Ecology Symposium, Monash University, November 28, 1970.

(3) Ride, W.D.L. 1970. A Guide to the Native Mammals of Australia.

Table 1. Summary of the effectiveness of 2 trapping methods.

| Trap Type 1/ | No. Trap Nights | No. Catches | Catch Rate (%) |
|---|---|---|---|
| Box traps | 1,494 | 137 | 9.2% |
| Rat traps | 1,158 | 32 | 2.8% |
| Totals | 2,652 | 169 | 6.4% |

1/ Other types of traps tested include spring and noose snares, pit traps and wire funnel traps.

Table 2. Distribution of Species trapped in relation to cover type.

| Species 2/ | Type of Habitat 3/ | | | | |
|---|---|---|---|---|---|
| | Swamp Edge | Darling Scarp | River Basin | Up-land | Totals |
| No. of trap nights | 1,325 | 293 | 220 | 814 | 2,652 |
| Ship Rat (Rattus rattus) | 46 | 24 | 3 | 1 | 74 |
| Mardo (Antechinus flavipes) | 60 | - | - | 5 | 65 |
| Common house mouse (Mus musculus) | 3 | - | 4 | 1 | 8 |
| Short-nosed bandicoot (Isoodon obesulus) | 10 | - | - | - | 10 |
| Western water rat (Hydromys fuliginosus) | - | 4 | - | - | 4 |
| Ferral cat (Felis catus) | 3 | - | - | - | 3 |
| Little mouse sminthopsis (Sminthopsis murina) | 1 | - | - | - | 1 |
| Spotless crake (Porsana tabuensis) | 2 | - | - | - | 2 |
| White-breasted robin (Eopsaltria georgiana) | 1 | - | - | 1 | 2 |
| Totals | 126 | 28 | 7 | 8 | 169 |

2/ Not included in the above list are the quokka (setonix brachyurus) and the black-gloved wallaby (Wallabia irma). Three of each species have been trapped in swamp vegetation with wire snares.

3/ Representative vegetation for the different cover types is as follows -

(a) Swamp edge - tea-tree, Swamp banksia, cut-rush, sharkstooth, macrozamia, xanthorrhoea and lepidosperma.

(b) Darling scarp - overstory of E. marginata, E. calophylla and E. laelii; understory of macrozamia, xanthorrhoea, acacias, grevillia, watsonias and cut-rush.

(c) River basin - overstory of E. marginata, E. calophylla and E. patens; understory of dense macrozamia and bracken.

(d) Upland - overstory of E. marginata and E. calophylla with a wide variety of understory species including macrozamia, xanthorrhoea, acacias, etc.