W.A. University's Marsupial Breeding Station

In S.W.A.N.S. Vol. 4, No. 2, 1973, an article featured the Western Australian University's Marsupial Breeding Station at Thompson Lake Reserve, Jandakot. Planning and management techniques of the station were outlined giving an indepth look at future study possibilities.

The following interesting report has come to hand and is now reprinted to show the progress and present work being done at the station.

THE UNIVERSITY OF WESTERN AUSTRALIA MARSUPIAL BREEDING STATION, JANDAKOT
(Reserve No. 29241)
ANNUAL REPORT—APRIL 1976/1977

(a) Progress of Research Programmes

Mr R. Whelan's research towards his Ph.D. is now being concluded and writing up is in progress.

The important points to come out of Whelan's work are that in burns which leave a clear mineral ash bed, regeneration of vegetation from seedlings is good, whereas in places where there is still some litter or where the burns are not extensive, a great deal of predation by herbivores such as grasshoppers prevents the establishment of seedlings. Not all species are equally palatable—e.g. *Sterlingia latifolia* is unpalatable, while some legumes (for example, *Jacksonia sternbergiana*) are so palatable that their regrowth can be severely regulated by insect grazing.

This finding is particularly important, since work by Honours students in previous years has shown that at about 8-10 years of age *Jacksonia* is a significant component in the shelter requirements of macropods.

Another significant finding from Whelan's work is that *Banksia* seedlings are significantly better established in the second rather than the first year after burning.

Work is proceeding on other aspects of the biology of *Banksia* trees. The ability to produce viable seedlings is seen as being composed of the following elements:

The efficiency of pollinators.

The predation of seeds once they are set.

The predation of the seedlings after they have germinated.

The competition between trees as they grow.

The pollination aspect has been studied by Whelan and Burbidge who have continued the work commenced in earlier years.

John Scott started a project investigating the predispersal predation by insects of *Banksia* seeds, and Dr R. Black has continued his project on spacing of species in *Banksia* woodland.

Mr B. T. Clay has continued his research on the long-necked tortoise, and has marked an additional 17 animals. Total number of animals marked to date are: adults 176, and juveniles 125. Recaptures are high—approx. 50%. The same investigator has begun the following two projects:

(1) A study of the epidermis of the leaves and stems forming the diet of the macropods. From this study it will be possible to establish a collection from which dietary material of the macropods can be determined.

(2) The growth rates of various *Banksia* species and the growth rate of Jarrah. Both of these are of importance in managing the Reserve.

(b) Teaching

(1) *Honours Projects:*

(i) Spread and survival of *Theba* (Land Snail).

(ii) Post-dispersal predation of *Banksia* seeds.

(2) *Third-Year Projects:*

(i) Territorial behaviour in male dragon-flies.

(ii) Spacing in *Tettigonioidea.*

(iii) Grasshopper feeding selection in two habitats.

(iv) Effects of fire on insect populations.

(3) *Second-Year Projects:*

(i) Food selection of honey-eaters.

(ii) Seed predation on *Banksias.*

(4) *First-Year Project:*

Responses of Arthropods to increased cover.

These projects are much less detailed than those listed under Section (a) above, and they are given only in outline.

(c) Monitoring

The State Health Department continued to monitor animals and water for *Salmonella.* The reserve still remains free of any invasion of *Salmonella* other than indigenous species.

The Public Health Department continued to measure atmospheric levels of sulphur dioxide. Levels of sulphur dioxide increased considerably during the year with 129 micrograms per cubic metre recorded on December 6, 1976, and this converted to parts per million equals 0.11 ppm. The California Standard for ambient air quality suggests that 0.3 ppm for 8 hours is damaging to vegetation. Monitoring is continuing.

(d) Works and buildings undertaken in the past year and proposed for the ensuing year

The intertior of the laboratory was repainted. Shelving and hanging space was added to each individual room. One sink cupboard and shelving above the sink plus an extension of the work-bench were also completed.

A new implement shed was completed during the year and is now in full use.

Due to the dry season drinking water for macropods was piped to Russell Swamp, Melaleuca Swamp and Banganup Lake. At all three points concrete troughs with ball valves were installed.

A fully-equipped laboratory has been proposed for the future, due to student pressure on existing facilities.

(e) The condition of the flora and fauna on the Reserve

Sixty-seven quokkas were introduced from July to October. Most of these animals were two-year-olds direct from Rottnest. A trapping programme by the Warden resulted in the following:

(1) 17 quokkas captured;

(2) all but two animals had increased in body weight;

(3) animals were caught in the north-west corner (Pearse and Russell), eastern and northern edges of Banganup Lake and Russell Swamp.

All animals had been released at boat-ramp (northern edge of Banganup Lake). During the trapping programme of 16 trap nights using 12 box traps, 17 quokkas were captured with 10 recaptures and 4 double recaptures; 15 possums and 8 bandicoots were also captured.

Considering the dry summer, kangaroos are in good condition and are still breeding well. Male offspring still outnumber females. Culling of some of the males is expected during the next year.

The vegetation appears to have suffered due to poor winter rains and the long, hot, dry summer. *Banksia* species appeared to lose more leaf than normal. *Banksias* in certain areas have died, e.g. Russell Swamp. It was thought that the trees were infected with *Phytophtora* but an investigation by the C.S.I.R.O. proved that this was not the case, although *Phytophtora* was discovered within the Thompson Lake Reserve not far from Russell Swamp.

A management plan was drawn up for the Reserve, and a burning programme was to be started during the Autumn of 1977. Various research programmes concerning these burns were also proposed. Unfortunately, due to the fire of March 14, 1977, this programme now has to be reorganised.

The area burnt by the fire on March 14 amounted to a little less than half the Reserve, and more than half of the burnt area included the Lake. The following research programmes within the burnt area have been instigated:

(i) Small enclosures have repeatedly demonstrated that grazing animals closely regulate the post-fire plant regeneration. However, the cost of fencing effectively precludes the application of this knowledge in large-scale regeneration, and so an experimental 10 000 square metre plot has been installed so that its effectiveness in keeping kangaroos out can be assessed.

(ii) Observations of territorial behaviour of kangaroos within the burnt area are made on a regular basis in order to see whether aggregation on the burnt area outside that enclosed in (i) above is leading to any abnormal behaviour on the part of the kangaroos.

(iii) This has been done in conjunction with observations on the feeding habits of kangaroos who, as is well-known, aggregate on burnt areas.

Lake Banganup dried up completely on January 25, 1977, except for some small water-holes in the south-east corner (discovered since the burn).

Total rainfall for 1976 was 718.3 mm, with a total of 95 rainy days.

Some 430 visits were made to the Reserve by staff, students and visitors.