Nature Reserves-Why and how

Although Western Australia has set aside more than 1 000 reserves for the conservation of flora and fauna, the total area they cover (about 9.1 million hectares) is relatively tiny in comparison to the size of the State. Consequently the siting of these reserves and their subsequent management is crucial in preserving Western Australia's often unique plants and animals.

Most people have some understanding of why man sets aside reserves for the conservation of flora and fauna but there are still some who think it is only because of pressure from preservation extremists or to provide academic stimulation for white-coated boffins in dusty halls of learning. Instead, it is because that branch of science known as ecology has brought about an increased awareness of the close relationships that exist between man and his environment; and also because our native animals and wildflowers have an aesthetic appeal.

Most ecologists would be the first to admit that the depth of man's knowledge of the role of each organism in the biosphere, and his understanding of the interaction between these organisms, is still very, very limited. Nevertheless, man has blundered along making sometimes irreversible decisions at the expense of future generations. But one thing he has learnt is that if, by destroying its habitat, he causes a species to become extinct, there can be no recall later if he discovers the animal had a vital role to play in the environment.

Once a species is extinct the position is final. No further research can be done, no more learnt from it or from its relationships with other species, including man. For we can learn a lot from other animals, and not just behaviour patterns; it has already been shown that research on the quokka may aid medical science, particularly in the study of muscular dystrophy. There are many other links between man and other animals, and surely thousands are yet to be discovered.

This reason alone is sufficient justification for creating reserves and conserving wildlife populations and their habitat; but what of the inalienable right of every animal—the right to live? This is the cry of the sentimentalists; it is a plea for preservation rather than conservation, and overlooks the natural high mortality of animals which is a part of nature. It is as amoral to cause the depletion of a species by overprotecting it, as it is to destroy its habitat or shoot it out. What we must do to ensure an animal's "right to live" is establish reserves and manage them so that the habitat does not deteriorate through the introduction of outside influences, e.g. man, weeds, and unnatural predators. The term "unnatural" predators is used because the prey/predator relationship plays an important role in the balance of Nature and introduced predators, e.g. foxes, upset this ecological balance.

Reserve Management

The Reserve Management Unit of the Department of Fisheries and Wildlife was created in 1968. Its initial problems were manifold; little work had been done on the problem of reserve management either in Australia or overseas, and the unique nature of Western Australian fauna and flora meant that there was little information available and even fewer established techniques or guidelines. The management of a piece of natural bush is much more complex than farm management, because instead of managing for a few species of plants and animals, one must maintain complexity where there are large numbers of plant and animal species.

Number of Reserves

At present (June 1980) in Western Australia there are about 1 036 reserves for the conservation of fauna and flora, comprising 9.1 million hectares. Of these, 555 (comprising about 8.8 million hectares) are vested in the Western Australian Wildlife Authority. The responsibilities of the Authority and the Reserve Management Unit are to establish new reserves, ensure they are in the right place, are of the right size, and are properly managed.

Determining the size of a reserve is of paramount importance; a suitable size in one area will not be suitable in another. In the deserts a greater area is necessary than in a high rainfall area because of the lower density of plants and animals in dry country. In Western Australia, it is considered that 20 000 ha is the minimum size for a reserve which will continue to harbour a full range of plants and animals; reserves under this size need careful management if they are not to be altered drastically by external influences.

When the land around a reserve is cleared for farming, the character of the reserve begins to change. What was once a portion of a large area of unbroken bushland becomes an island surrounded by country which most of the animals are unable to inhabit. The reserve commences a change in character due to outside pressures such as the introduction of weeds like wild oats and introduced animals like rabbits, foxes, cats, dogs, rats and mice. Fire also tends to become more frequent with consequential effects on the plants. A reserve affected by these external influences, slowly and inevitably will change over a period of many years; plant associations will deteriorate and the animals they support will decrease in variety and numbers. Because the unfavourable pressures are exerted from the outside of a reserve, a smaller reserve will be affected more quickly than a larger one since the buffer zone which is

created around the perimeter forms a greater percentage of the overall area, and the centre of the reserve is relatively close to the cleared land. This has already occurred in many smaller reserves in the south-west of the State.

Importance of Fire

This outside pressure is only one factor affecting the changing character of a reserve. In smaller reserves there is a much greater chance that a fire will burn out a whole area and destroy all the food and cover for a particular species. A word here about fire control in relation to the management of reserves. Fires have been going through this country for hundreds and thousands of years. Some plants e.g. some species of wattles (*Acacia*) actually require a certain intensity of heat from a fire in order for their seeds to commence germination, but if fires occur too frequently the young plants will be unable to reach maturity and set seed to establish future generations.

Hence both the intensity and frequency of fires are factors of great importance to the survival of many species of Western Australian plants.

Over time, leaf litter tends to build up on the ground surface with increasing fire risk, eventually leading to infrequent hot fires and this was probably the situation over most of Western Australia before the arrival of Europeans. Nowadays, to reduce the danger of fires going out of control many areas within Western Australia, outside of Nature Reserves, are subject to frequent cool burns before leaf litter has time to build up and this in effect is a major environmental change that will tend to favour some plant species at the expense of others.

In larger reserves pockets of land will remain unburned and the animals there will repopulate the areas as they recover. Thus paradoxically, the larger the reserve the less management it requires. These larger reserves are usually in the more remote parts of the State and are known as Primitive Areas.

One such reserve is Lake Magenta in the Shire of Kent.

▲ Certain species of *Acacias* require a critical intensity of heat from a fire in order for their seeds to germinate.

▼ Controlled fuel reduction burning of one of the blocks of the strategic fire buffer at Two Peoples Bay Nature Reserve in September, 1980.

Management Plans

At present, the Department's Reserves Management Unit is preparing a detailed plan of management for the Lake Magenta Reserve which, once it is approved, will be in force for the next ten years. The draft plans were open for public comment for several months earlier this year and among those who contributed their ideas on the proposed management of this reserve were adjoining landholders, naturalists, shire officials, conservationists, scientists and fire control officers. It is only through the participation of the community in their management that Nature Reserves can best serve the interest of the people for whom they were set aside.