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DEPARTMENT OF FISHERIES AND WILDLIFE

THE MANAGEMENT OF NATURE RESERVES IN WESTERN AUSTRALIA

- A REVIEW

PREPARED FOR

CONSERVATION AND ENVIRONMENT COUNCIL

THE RESOURCE

On 30 June 1978 there were 1003 nature reserves with an area of 8 298 648 ha. Of these 435, totalling 8 086 314 ha were vested in the Western Australian Wildlife Authority and five, totalling 639 ha were vested in the Minister for Fisheries and Wildlife. Most of the remaining reserves are unvested, although a few are vested in Local Authorities. A significant number which are for the joint purpose of Water and the Conservation of Flora and Fauna are vested in the Minister for Water Supplies.

Most Nature Reserves are fairly small. The 15 largest account for 7 605 279 ha; the average size of the remainder is 803 ha. Most Nature Reserves are located in Agricultural Areas and are surrounded by developed agricultural land.

PRESENT AND PLANNED STAFFING

In 1976 the Department published a Report (No. 23, attached) which outlined the immediate needs for extra staff to implement management plans on Nature Reserves. Briefly the Report recommended that three management teams, each of 2 public service staff and one or more wages staff, be stationed in the wheatbelt at Pingelly, Katanning and Wongan Hills. In addition two Reserves Officers were to be stationed at Karratha (Dampier Archipelago) and Bernier Island and a Senior Reserve Management Officer was to be stationed in Perth. Increased research work was also recommended.

Cabinet agreed to implement the report over a period of four years, except that the increase in research was seen as a growth in an

existing activity and was to be handled as such. The public service members of the first wheatbelt team were appointed to Pingelly and a Reserves Officer was appointed to Karratha in the 1976/77 financial year. Further appointments were suspended in 1977/78.

Research and planning in reserve management have been stepped up by a reallocation of existing resources.

Present effort, therefore, is:

Wanneroo

Research:	Plant Ecologist and Technical Officer Animal Ecologist and Technical Assistant (Temporary)
Planning:	Reserve Management Officer (Planning) and Technical Officer
Operations:	Reserve Management Officer Senior Technical Officer Labourer (+ 2 during summer only)

Pingelly

Operations:	Reserve Management Officer + Technical Officer

Karratha:

Operations:	Reserves Officer

Two Peoples Bay:

Operations:	Reserves Officer

Total Staff:	Research	4
	Planning	2
	Operations	6 + 1 wages

Both the research and operations areas are at present under the overall control of the Chief Research Officer (Wildlife).

Although the number of staff allocated to Reserve Management has grown slowly over the past decade the Department's responsibilities in this area have also grown. In 1969, for example, there were only 269 Nature Reserves with a total area of 2 342 966 ha.

CURRENT DEMANDS

The Department's responsibilities continue to grow even in the present period of zero staff growth. Growth is occurring in the following areas:

(a) Creation of new nature reserves. About 40 to 50 new nature reserves are gazetted each year. Some of these are reserves previously set aside for another purpose, e.g. timber, some are derived from vacant Crown land.

(b) Vesting of existing unvested Nature Reserves. While the Wildlife Conservation Act does not distinguish between vested and unvested reserves the Department has always placed priority in the allocation of management funds to those reserves vested in the W.A. Wildlife Authority. A review currently being undertaken for the Department by the Western Australian Museum of unvested Nature Reserves in the Wheatbelt will probably result in around 200 additional reserves being vested in W.A.W.A.

(c) The interest of the general public in nature conservation. There is an increasing interest by the public in conservation matters and a corresponding increase in demand for information and action on nature conservation. Use of the Two Peoples Bay Nature Reserve has risen from an average of 200 cars per month in 1970 to about 2 000 cars per month in 1978.

(d) Increasing pressure on the Department in relation to prescribed burning. Controlled or prescribed burning for fuel reduction

is becoming increasingly popular as a method of bush fire control. The Bush Fires Act has given adjoining landholders and Bush Fire Control Officers the right to enter and burn reserves since the 1950's. A recent amendment withdraws these rights where the Bush Fires Board is satisfied that the reserve management plan provides "adequate fire protection in relation to the reserve and that the exercise of the powers conferred.... would be likely to interfere with the development of the reserve". Education programmes by the Bush Fires Board have drawn these facts to the attention of an increasing number of people resulting in pressure on the Department to write and enact management plans which protect adjoining landholders.

FIRE

Research data on the relationship between fire and the indigenous flora and fauna are few. Most studies done so far relate to relatively high rainfall regions, usually thickly vegetated or forested. This has led some people to extrapolate such data to low rainfall regions although it is clear that this is not valid. A few points may help show the complexity of the situation in relation to fire and the natural environment:

(i) Coastal heath vegetation at Two Peoples Bay Nature Reserve (800 mm annual rainfall) will carry a fire one to two years after a burn. CSIRO studies on an area burnt in 1970 show that the rare Brown Bristle-bird does not re-invade burnt heath vegetation until 8 to 10 years after a fire. The reserve harbours three very rare species of birds and each has different requirements in terms of habitat and burning frequency. Studies on the regeneration of heath vegetation at Two Peoples Bay show comparable trends to eastern states studies on similar areas which suggest that biomass accumulation levels off after 20 to 25 years.

(ii) Studies at Tutanning Nature Reserve (450 mm rainfall) east of Pingelly and at Dryandra Forest indicate that the Woylie, a rare wallaby, requires old, dense stands of poison shrubs for shelter. It has been suggested that the "ideal" management in these areas would be a series of hot fires so that an area is burnt about every 40 to 50 years. It is clear that frequent (e.g. 10 or 12 year interval) low intensity fires eliminate this type of habitat.

(iii) Studies on offshore islands (e.g. Middle Island, Bald Island) show that plant and animal species will persist in the absence of fire for periods exceeding 150 years.

(iv) Burning of wheatbelt reserves surrounded by agricultural land leads to the invasion of exotic plants, especially annual grasses and herbs. Frequent burning, in fact, compounds the fire hazard, rather than reducing it, and leads to the degradation of the indigenous vegetation.

(v) It is possible for a fire to change the character of vegetation without altering the long term species composition. Thus, a hot fire in the eastern and north-eastern wheatbelt can kill the above ground portion of a tree which then regenerates from a ligno-tuber as a mallee. Post-fire germination leads in the long term to new trees developing but frequent fires will only allow a mallee to exist. Nesting hollows for birds are then lost. Similar relationships between the frequency of fire and the type of vegetation have been demonstrated elsewhere, notably in Tasmania.

In general, the Department's policy is that, in the absence of adequate research data, Nature Reserves, especially those in the wheatbelt, be burned as infrequently as possible. Where the Reserve is large it is usually comparatively easy to develop a management plan where buffer strips around the edge are burned more frequently than is biologically desirable, thus providing protection to adjoining landholders. Most Nature Reserves, however, are small

and it is not possible to burn buffer strips without sacrificing an unacceptably large proportion of the reserve.

The Department is mindful of the problems reserves can cause a farming community and is seeking to minimise their impact on adjoining landholders. The main method at present in use is the construction of boundary firebreaks to protect boundary fences. Where the size of the reserve allows internal breaks are also constructed so that wildfires can be contained without burning the whole reserve and so that prescribed burning can be carried out. Current expenditure on firebreak construction and maintenance is about $50 000 per annum and so far some 110 Nature Reserves have been firebreaked by the Department.

The Department has instituted an experiment in cooperative management of Nature Reserves in the Shire of Kojonup. Here a local conservation society and the Local Authority are cooperating in a prescribed burning programme, the effects of which are the subject of research by the Department and the W.A. Institute of Technology.

The provision of further management teams and Reserves Officers will allow the Department to react effectively to management needs. The Department needs to demonstrate that a policy of infrequent fires does not significantly affect adjoining landholders. The Department is at present examining the predictive fire model of Stephen Kessel of Gradient Modelling Inc., U.S.A., to see if it can be applied to Western Australian environments. The computerised model integrates ground resources information (topography, vegetation, fuel accumulation, etc.) with meteorological data to predict the path of a fire. If successful this will substantially enhance the Department's ability to control wildfires on reserves.

SUMMARY

The flora and fauna on Nature Reserves will only persist in the long term if:

(a) there is a sound scientific basis for management of Nature Reserves,

(b) there is an effective field force to implement management, and

(c) Nature Reserves are accepted by the local community of an area as a valid form of land use which enhances rather than detracts from the District.

Education is of great importance in realising the above points; so is the provision of adequate staff and the development of management techniques. In the meantime, the Department seeks the cooperation of farmers, Local Authorities and other Government Departments to ensure that our heritage is not lost or frittered away before it can be managed effectively.