DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

POLICY STATEMENT NO. 31

MANAGEMENT OF RESERVES FOR THE CONSERVATION OF NATURE

MARCH 1990

1. BACKGROUND

1.1 Conservation Strategy

This paper deals with management principles and policies for nature reserves, national parks, conservation parks and zones in any Departmental lands or waters which have nature conservation as their primary purpose. These are based on the primary objective "Conservation" from the Departmental Strategic Plan - that is "to conserve the indigenous plant and animal species, and environmental processes in natural habitats throughout the State".

The fundamental aim of nature conservation is to maintain genetic resources (i.e. indigenous species and genetic variation within species), biological communities, and ecological processes such as nutrient and hydrological cycles and energy exchange through trophic levels.

"Conservation through reserves" is a strategic approach to help achieve this aim. Through an integrated system of conservation reserves, appropriately managed and broadly representative of the landforms, marine and inland aquatic systems, biogeographic districts and biota of Western Australia, the aim is to maintain habitat and the necessary evolutionary processes and ecological support systems which will maximise the long term persistence of species and communities. As well as being broadly representative, a reserve system must include "special" areas to encompass rare species and ecosystems, geographical outliers, and unique or spectacular landforms.

1.2 The extinction process and diversity (i.e. species richness)

Extinction and speciation are normal parts of the evolutionary process and there have been periods in geological time characterised by a high rate of one or the other. It is often not possible to separate human causes from natural ones bringing any species to the brink of extinction. However, there is overwhelming evidence of human factors being the cause of, or a major contributor to, the present alarming rate of local and total extinction of plants and animals both in Australia and elsewhere. Thus, maintenance of diversity implies trying to prevent further loss of native organisms through either human or apparently natural causes.

In nature, species population numbers and community structures are rarely constant (or in equilibrium). Species richness does not depend on maintaining a static state. On the contrary, static or equilibrium ecosystems may be of relatively low diversity with respect to species composition and ecosystem complexity. Long-term high diversity depends upon complex interactions, and environmental heterogeneity in space and time. Thus, maintaining stability could be counter-productive to long-term nature conservation if the primary objective is to maximise ecological, species and genetic diversity.

However, an ecosystem in a mature state, though with low internal diversity, may represent a unique habitat and community type and be worthy of maintenance and protection in its own right, contributing to the overall diversity of the statewide reserve system. Also, some reserves may be managed primarily to maintain populations of a single species or group of selected species and the management strategy may or may not require environmental constancy, depending on the biology of the species to be favoured.

Some conservation reserves have been greatly modified by human intervention (e.g. Herdsman Lake). In such cases the objective may be not to preserve or restore "natural" conditions but to create new habitat(s) for particular kinds of plant or animal, or enhance habitat so that it may support larger wildlife populations.

With these important provisos, the general aim of this policy is to manage a system of conservation reserves so as to achieve and maintain natural species and ecological diversity in the long-term.

In stating this aim, it is recognised that some reserves may be large enough to be self-sustaining, i.e. capable of meeting objectives of diversity without human interference. Such reserves will allow more mobile species to move between different parts of the reserve and utilise variable food or habitat resources. They may be large enough to permit natural re-establishment of populations and communities following localised catastrophic events and natural adjustments of species population numbers and community composition to changing environment.

It is also recognised that an integrated mosaic of carefully selected smaller reserves, appropriately located and spaced, may suffice to maintain regional habitat diversity and species richness, although organisms incapable of dispersal across the intervening spaces will be disadvantaged. There may be adverse evolutionary consequences in the case of fragmented populations of species with limited dispersal capacity.

In general, bigger reserves are more effective for nature conservation than smaller ones.

1.3 Existing conservation reserve system

At 30 June 1988, Western Australia had a system of conservation reserves comprising: 1 211 nature reserves (totalling almost 10 000 000 hectares) for the specific purpose of nature conservation; 56 national parks (4 649 732 hectares); and 2 marine parks (233 350 hectares). A number of conservation parks (about 187 000 hectares) are soon to be declared for the dual purposes of nature conservation and public recreation.

In addition there are large areas of multiple-use reserved land, namely State forest and timber reserves (almost 2 000 000 hectares) which have timber and water production, public recreation, nature conservation and other uses.

In the future Regional Parks may be established with nature conservation as a primary purpose; CALM will often be one of several agencies involved in their management.

Since the 1960s many wide road reserves have been created specifically for the conservation of native flora in newly developed agricultural areas, and form important ecological corridors.

Many new conservation reserves have been established in recent years but the system is not yet adequately representative of the State's flora and fauna and habitats even at the coarse level of Beard (1980) which is the only Statewide classification of vegetation systems available. Selective acquisition of additional land and water is needed, and major community types not discriminated by Beard (1980) still remain to be identified by surveys (McKenzie and Robinson 1987).

Some WA conservation reserves (e.g. Prince Regent Nature Reserve) are large. However, many (especially in the Wheatbelt Region) are small, isolated and modified remnants of the pre-existing biota surrounded by farmland. Nevertheless, even the smallest reserves have an important role in the retention of examples of the native habitat which existed before fragmentation of the original landforms and vegetation, and in providing habitat for certain sedentary elements of the fauna, and corridors or linkages between reserves as well as habitat for migratory and nomadic species.

Western Australia has many wetland nature reserves, some of which are essential habitats for migratory waterbirds whose conservation is subject to international treaties. The degrading condition of many wetland reserves and the fact that, in most cases, CALM does not manage all of the reserve's catchment, is a major problem. Few wetland systems are unaffected by chronic changes in hydrology or water quality caused by pastoral, agricultural, urban or industrial practices in the surrounding areas.

Many island nature reserves off the Western Australian coast are of special significance in retaining populations of species extinct or rare on the mainland and in providing breeding habitat for marine mammals, birds and reptiles.

1.4 Management needs

Reserves in inhabited areas are often surrounded by farmland or pastoral land and subject to increasing visitor-pressure. Often such reserves can be burnt too frequently. Some large desert reserves are isolated and no longer occupied by Aboriginal communities. These areas are being burnt less often, but at a greater intensity over a wider area than in the days of Aboriginal tenancy. These changes, together with colonisation by exotic predators, herbivores and weeds have had profound long-term ecological consequences. Even the largest and most remote reserves require some management of fire, visitors and feral species if they are to be sustained without loss of native species.

Many conservation reserves are so small that it is unlikely they can sustain their complete assemblage of species indefinitely. They pose particularly difficult management problems. Progressive decline in species-richness is evident already in some small reserves. The causes of decline are complex and may involve both natural and man-induced factors. Isolation (reduced immigration rates) and small population size (genetic inflexibility and increased local extinction rates) may result in progressive attrition of reserve floras and faunas. Ecosystems in small homogeneous reserves lack resilience for response to cyclic climate changes or episodic catastrophes such as floods, droughts and wildfires, which may hasten the process of species loss.

Human-induced biotic decline can result from land-use practices external to the reserve or inappropriate practices within it; for example unsuitable use (or non-use) of fire, introduction of pests and weeds, illegal activities such as grazing stock or hunting, dumping of rubbish, making of tracks, mining, some forms of recreational use, and practices on neighbouring land including clearing and draining which result in salination, erosion or changed hydrological conditions. Many existing nature reserves are already degraded and require action to prevent or remedy environmental damage from such sources.

1.5 Survey, research and management

Reserve size, condition, character and biota vary enormously, as do the forces that influence capacity to support biota in the long term. Ideally, conservation values and the forces affecting them should be individually assessed for each reserve and management prescriptions designed accordingly. Survey and inventory of "the estate" is a primary need.

An adequate ecological basis for management planning is rarely available. Nor is there an adequate theoretical base for habitat management aimed at maintaining maximum diversity of species. Some general rules of thumb, or simple technical guidelines have been developed for managers but have not been field tested over long periods. While this is being done, it is necessary to determine such principles as may be generally applicable, and to set priorities for reserve management programs.

For the longer term, ecological research is a necessary investment. Monitoring environmental and ecological change and investigating community processes are essential so that we may understand natural variations in community structure and the processes and driving forces which cause decline in species-richness. We can then implement preventative or corrective management practices, and measure positive or negative changes which result.

2. OBJECTIVE

To select and manage conservation reserves, and take other steps necessary, to ensure the long-term maintenance of species and genetic diversity and the persistence of those habitats, indigenous species and ecological processes that comprise Western Australian ecosystems.

3. GENERAL POLICIES

The Department will:

1. Seek to establish and manage a Statewide reserve system that:

   (a) is broadly representative of the State's natural habitats and contains viable populations of all species of animals and plants representative of the indigenous Western Australian flora and fauna;

   (b) forms a network of natural lands and waters which are sufficiently large and appropriately located and spaced to provide refuge for migratory and nomadic species as well as habitat for sedentary species; and

   (c) protects areas of special nature conservation value.

2. Manage these reserves to maintain the existing suite of native species, where appropriate to re-establish species which have been lost from the area, and in special cases, provide appropriate habitat for particular species or communities.

3. Determine and maintain those ecological processes that are essential for the persistence of natural communities and ecosystems, promote opportunities for enhancing current biotic diversity where appropriate and eliminate or reduce those processes such as loss of habitat and predation that result in a reduction of biotic diversity.

4. Maintain the most favourable possible habitat and ecological conditions for species of indigenous plants and animals in danger of extinction.

5. Protect conservation reserves against natural or man- induced changes detrimental to the maintenance of conservation values in the long-term, whether such changes arise from events or activities inside or outside the reserves.

6. Rehabilitate conservation reserves which have suffered detrimental changes in the past, as laid down in Policy Statement No. 10.

7. Undertake ecological research to develop a knowledge base and management techniques and guidelines appropriate to reserve management objectives.

8. Monitor change in reserve environments and selected species populations and translate and incorporate results into management objectives, as laid down in Policy 28.

9. Encourage the use of nature reserves and national parks for non-destructive and management-oriented research, and appreciation of nature.

10. Encourage the adoption by the public of a "conservation ethic", which recognises the rights of future generations and the responsibilities of the present one to manage natural resources such that the opportunities, the environmental quality and natural values we enjoy remain for future generations as well.

4. STRATEGIES

4.1 Establishing a representative reserve system

Assess and characterise the qualities of existing nature reserves, national parks and conservation parks to determine conservation values and particular management problems in each one.

4.2 Develop simple means of measuring and mapping species richness and diversity for selected groups of organisms.

4.3 Evaluate the extent to which conservation reserves act as a system, both internally and when integrated with State forests, timber reserves, unalienated crown land and other land.

4.4 Assess the extent to which the existing reserves are representative of the biota of Western Australia and develop a strategy for acquisition of additional land for reservation where the existing nature conservation reserve system is shown to be deficient.

4.5 Develop a set of priorities for each region for the allocation of resources to research, planning, and management of conservation reserves. This process should be based on identifying those steps which protect the most species, including those most at risk, and natural processes such as nutrient flows and hydrological cycles.

4.6 Include as much as possible of the catchments of wetland reserves in the reserve system.

4.7 **Management**

Identify the minimum data set required for management of each reserve. This is likely to include legal requirement on the land (e.g. firebreaks); the presence of gazetted rare flora or fauna or pest species; processes which will degrade environmental values if left unchecked; "special" (e.g. species rich or geographically restricted) communities; keystone species of plants or animals which may be critical to ecological processes; species or communities particularly sensitive to various disturbances; past and present fire regimes.

4.8 Develop and keep updated an inventory of conservation reserves containing information on vesting and management history, location, size and shape, landscape, biotic diversity, environmental condition, and the presence of any species in need of special protection.

4.9 Prepare management plans for conservation reserves or groups of reserves with clearly defined objectives for maintenance and, where necessary, restoration of identified conservation values, and with special emphasis as appropriate on:

(i) maintenance of species-richness and continuance of natural ecological processes;

(ii) protection for rare or endangered species including, where appropriate, reintroduction to areas from which species have been lost;

(iii) protection for unique or unusual habitats or communities;

(iv) maintenance of habitat for migratory species; and

(v) control or prevention of endangering processes such as salination and its causes, introduction and spread of *P. cinnamomi*, habitat alteration, hydrological changes, predation and overgrazing.

4.10 In the absence of a management plan for conservation reserves, or of adequate biological or ecological data, managers will:

(i) conduct only those operations necessary to protect the reserve's wildlife and landscape;

(ii) oppose all exploitation or intervention likely to damage nature conservation values;

(iii) stop external, man-made influences (feral animals, weeds, saline drainage etc.) and rehabilitate old damage (gravel pits etc.) with endemic species grown from locally collected seed (see CALM Policy 10);

(iv) permit, where appropriate, known natural processes (such as occasional natural flood or fire);

(v) constantly update management methods in the light of the results of research and monitoring; and

(vi) take all possible measures consistent with a reserve's purpose to promote pride and ownership by local communities.

4.11 Liaise, and where possible enter into management agreements, with managers or owners of catchments of wetland reserves and Government agencies whose activities may impinge on conservation reserves.

4.12 Exclude from conservation reserves as far as practical, species of plant and animal not native to the area. Where exotic organisms are or have been introduced, eradicate them from the reserve or, where that is not possible, control their populations to minimise damage to the conservation values of the reserve.

4.13 Eliminate or reduce those processes which result in a reduction of biotic diversity or resources, and promote opportunities for enhancing current diversity of the indigenous biota through habitat management, reintroduction of locally extinct species and provision or protection of habitat corridors for migratory species.

4.14 Provide firebreaks or other measures on conservation reserves (and neighbouring property) to assist in the control of wildfire and, as appropriate and within the limits of resources and safety, take necessary measures to suppress wildfires when they occur.

4.15 Where there is sufficient knowledge of the reserve, and where appropriate, use fire as a management tool to maintain the diversity of native species and habitat.

4.16 Exclude fire as necessary from reserve lands maintained for the conservation of fire-sensitive species.

4.17 Apply Departmental hygiene procedures in all operations to prevent the introduction and spread of *Phytophthora* species and exotic weeds.

4.18 Provide facilities to service those recreational or educational activities in the reserve which are prescribed in an approved management plan (see Policy Paper No. 18).

4.19 Limit road development to that which is essential for management access, or for public access to points of special interest, as prescribed in an approved management plan.

4.20 Ensure that any roadworks, buildings or other facilities serve the stated purposes of the reserve and are located and constructed in a manner which minimises environmental damage, especially the spread of plant diseases or weeds, and visual intrusion, and avoids damage to individuals or populations of rare flora or fauna or special habitats.

4.21 Undertake rehabilitation programs where necessary to restore natural values of conservation reserves (see Policy Paper No. 10), including the re-introduction of species lost from that reserve.

4.22 Undertake control programs for any native species which becomes abundant to the extent that the primary conservation values of a reserve are adversely affected.

4.23 Undertake research and monitoring programs designed to develop knowledge of biological communities, especially keystone species, and ecological processes, especially those which maintain species richness, and to assist in developing appropriate management.

4.24 Encourage and control use of conservation reserves for research, study and contemplative purposes so that public knowledge and appreciation of nature may be enhanced without adversely affecting the conservation values of the reserves.

4.25 Investigate public attitudes to nature conservation and environmental issues.

4.26 Conduct a positive information program, particularly in local communities, to encourage public support for, and involvement in, CALM's management programs, especially in seeking to maintain existing populations of native organisms.

4.27 Keep a register of people with expertise to provide advice on specific aspects of management.

References

Beard, J S - 1980. A new phytogeographic map of Western Australia. *Western Australian Herbarium Research Notes.* 3:37-58

McKenzie, N L and Robinson, A C - 1987. *A biological survey of the Nullarbor Region, South and Western Australia in 1984*. WA Dept. of Environment and Planning, Australian National Parks and Wildlife Service.

Syd Shea
EXECUTIVE DIRECTOR

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